JULY 15, 1912
VOL. III, NO. 5

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THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

Peerless 5-Ton Truck—One of three Peerless Trucks operated by the B. T. Babbitt Co., of New York, with capacity loads on heavy grades.

THE hill-climbing ability of the Peerless Motor Truck has been ably demonstrated in the service of the B. T. Babbitt Co., of New York.

Operating between the factories at Babbitt, N. J., and New York City, it makes six or seven trips daily, covering approximately seventy-five miles, with capacity loads.

The route includes the steep hills of the Hudson Palisades—thirteen per cent grades in places—which teams find difficult under half-loads.

Peerless hill-climbing efficiency is due to the reserve-power of the long-stroke motor, together with the powerful traction obtained by placing most of the load-weight over the rear wheels.

The Peerless sales-policy is based upon the firm determination to sell no trucks except where the conditions surrounding the owner's business are reasonably favorable to profitable performance. Correspondence is invited with that understanding.

TRUCK DEPARTMENT
The Peerless Motor Car Co.
Cleveland

PUBLISHED THE 15TH OF EACH MONTH

CHILTON COMPANY

MARKET & 49TH STS. PHILADELPHIA

Locomobile Trucks

We suggest the following as especially worthy of your consideration when investigating THE LOCOMOBILE:

Quality of Material

In building the Locomobile Truck, the knowledge of best materials, gained from fourteen years' experience in building the highest grade Motor Vehicles, has been of great advantage. Only the best materials are used. For example: The frame is pressed alloy steel, heat treated, instead of structural steel, as commonly used. The pressed alloy steel frame costs about four times as much as a structural steel frame and is about four times as strong, its elastic limit being approximately one hundred and ten thousand pounds to the square inch, whereas the elastic limit of structural steel is approximately twenty-five to thirty thousand pounds.

The use of high tensile strength bronze for the transmission case and motor base is another example of the quality of the material.

Experience and standing of manufacturer.
Every part designed for Heavy Duty Truck.
Standards of Workmanship.
Powerful Motor.
Five Bearing Crank Shaft.
Liberal Tire Equipment.
Four Speed Transmission.
Wide Faced Gears.
Governor Control.
Interchangeable Demountable Tires.
Large Front Wheels.
Strongest obtainable Driving Chains.
Chain Cases.
Differential Lock.
Steel Wheels.
Dry Disc Clutch.
Sprag.
Accessibility of Units.

Ignition and Oiling System not subject to Driver's Control.

The Locomobile Company of America

Executive Offices and Works:

Bridgeport, Connecticut

Service and Sales Branches:

New York, Atlanta, Chicago, Oakland, Philadelphia, Pittsburgh, San Francisco, Minneapolis, Boston, Baltimore, Washington, Los Angeles

THE BEST BUILT TRUCK Locomobile IN AMERICA

The Publishers' Personal Page

Motor Truck Value Increases With The Temperature

Knowledge of Truck Operation

Knowledge of the best methods of using commercial cars is essential to their successful use. This feature was strongly brought out to the writer in recent interviews with different truck users in the same kind of business. Many of these firms were obtaining very satisfactory service and saving money when compared to doing the same work with horses. Some had been users for over three years, had kept very accurate upkeep cost records; these users know exactly what it costs them to operate their commercial cars. They all acknowledge that it is a little difficult to make a comparison of costs between the motor and horse trucks, as the motor trucks have so extended the field and are doing work which they never were able to do with horses. When, under these circumstances, the writer encounters a firm in the same line of business within three or four blocks of the other companies, who say that their commercial car is not doing what it should, and are inclined to the belief that the use of commercial cars is questionable in their business; there are but two conclusions that can be reached, either they do not know how to operate a commercial car or their choice of car has been unfortunate.

The Remedy

There is a remedy for both of these ills. The writer finds that in just such cases no commercial car paper, or class literature of any kind giving the experiences of others, is read. The car was purchased without a previous thorough study and reading up of the mechanical details, and of the performance of the different cars on the market.

The Inevitable Result

under such circumstances is dissatisfaction and the conclusion that motor delivery in their particular line cannot compete with horses.

Statistics

That the industry is growing with astonishing rapidity is shown by the following:

According to Government figures of a year ago there were 31,000,000 horses in the country, and the annual production of horse-drawn vehicles was in the neighborhood of 900,000. The total number of horse vehicles was estimated at about 10,000,000. The commercial car makers naturally expect to supplant these horses and vehicles with motor-driven vehicles, and although all horses will not be eventually displaced there is no question but that a very large percentage will be. This at once gives an insight into the magnitude of the commercial car industry, and it must be remembered that these figures will be largely increased in the coming years.

In New York City

In January, 1910, the number of commercial horse-drawn vehicles in New York City was estimated at 231,000; at the same time registered figures showed some 783 motor vehicles in use by 274 owners. Later registration figures indicate that the number of motor-driven vehicles in use more than doubled in one year, in fact this rate of growth seems to hold good for the entire country, estimates indicating that the number of trucks produced in the United States will be doubled this year.

Possibilities of Industry

Referring to New York again, and considering that, on an average, a truck will do the work of three wagons, there will be required 77,000 motor trucks to replace the horse-drawn wagons in New York City alone. When it is reflected that this is double the probable output of all the United States truck makers for this year, the possibilities of the industry can be realized.

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The Commercial Car Journal

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MOTOR TRUCK CLUB MEETING

Owners Admitted as Associate Members

The June meeting of the Motor Truck Club was held on the evening of Wednesday, the 19th, at the Hotel Cumberland, New York City, and was attended by members from New York, Philadelphia, Bridgeport and Boston. Changes in the Club by-laws came up for adoption, and one of the most important of these was framed so as to permit commercial motor vehicle owners and users to join the Club as associate members. It is expected that such members will greatly add to the excellence of the work being done by the organization, and will bring the manufacturer and sales force in closer touch with the consumer, resulting in great benefit to the industry. During the month quite a few new members were admitted, bringing the number close to a hundred. The Secretary reports that inquiries have been received from other cities relative to the workings of the Club, and from these it is evident that similar organizations may be looked for. In view of the excellent work of the Traffic Department of the New York Police Force, a suggestion was offered and referred to a committee, that a gold medal, to be known as the Motor Truck Club Medal, be offered annually to the Traffic Squad. During the meeting Charles E. Stone read a paper entitled "Demonstrations," which aroused a great deal of discussion, and the feeling that certain general rules should be formed to care for such work.

MOTOR TRUCK WARRANTY

A standard form of warranty has been adopted by the National Association of Automobile Manufacturers, Inc. Its use is recommended to all manufacturers of commercial motor vehicles, and reads as follows:

We warrant the new motor trucks manufactured by us to be free from defects in material and workmanship, this warranty being limited to making good at our factory any part or parts thereof which shall, within ninety (90) days after delivery of the truck to the original purchaser, be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective.

This warranty shall not apply to any truck which shall have been repaired or altered outside of our factory in any way, so as, in our judgment, to affect its stability or reliability, nor to any truck which has been operated at a speed exceeding the factory rated speed, or loaded beyond the factory rated load capacity, or which has been the subject of other misuse, negligence or accident.

We make no warranty whatever in respect to tires, rims, ignition apparatus, lamps, gas tanks, signalling devices, generators, batteries or other trade accessories, inasmuch as they are usually warranted separately by their respective manufacturers.

The foregoing obligation to make good any defective parts returned as herein provided is in lieu of all other warranties expressed or implied, and of all other obligations or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our trucks.

CONVENTIONS OF THE NEAR FUTURE

It is our intention to publish in each issue a list of conventions of the various trades and associations which will take place in the near future. Owing to the growing popularity of commercial car delivery, committees are often appointed at these conventions to report on the possibilities of using commercial cars. Occasionally, papers are read and statistics given by truck makers or agents, and this list is given with the suggestion that commercial car manufacturers communicate with the proper parties, with the idea of arranging to give lectures, illustrated talks, statistics, etc., showing the advantages of motor trucks in these various lines.

July 17-19—Retail Merchants' Association of Virginia State Convention, Alexandria, Va. Samuel Cohen, Richmond, President, and I. H. Kaufman, Richmond, Secretary and Treasurer.
July 22-24—Texas Cotton Seed Crushers' Association Convention, Houston, Tex. W. A. Sherman, Houston, President.
July 29 to August 1—Texas Farmers' Institute Convention and Congress, San Antonio, Tex.
July 30 to August 2—Wisconsin Master Painters' Association Convention, Wausau, Wis.
July 30-31—Western New York State Volunteer Firemen's Association will convene at Rochester, N. Y.
August 4-6—New York State Retail Grocers' Convention, Hornell, N. Y.
August 5-6—Annual Merchants' Convention, Columbus, Ga.
August 6-9—Eighth Annual Convention of Illinois Master House Painters' and Decorators' Association at Rockford, Ill. W. S. Harper, President.
August 12-15—Annual Convention Wisconsin Retail Grocers' Association, Fond du Lac, Wis. Address E. J. Perry, President, Fond du Lac.
August 14-15—New York State Fruit Growers' Association Convention, Albion, N. Y.
August 20-22—Vermont Funeral Directors' and Embalmers' Convention, Brattleboro, Vt.
August 21-23—Indiana League of Post Masters' Convention, Marion, Ind. E. A. Bush, Reynolds, Ind., President.
August 27—Trans-Mississippi Commercial Congress, Salt Lake City, Utah. A. C. Trumbo, President. Edwin J. Becker, Secretary.
September 2-3—Kansas Rural Mail Carriers' Association convenes at Hutchinson, Kan.
September 26—National Firemen's Convention, Springfield, Ill. Thos. R. Johnson, Chicago, President. Bert Fisher, Chicago, Secretary.
October 23-24—Convention of New York State Real Estate Dealers' Association at Binghamton, N. Y. Frank L. Danforth, Buffalo, President. John Shaw, Binghamton, Chairman of Committee.

TRAILER KILLS CAR GUARANTEE

A user of two three ton trucks lately added two trailers for use on long hauls and was promptly called up by the makers of the cars and told that if he used the trailers his guarantee was off; no longer effective. Notwithstanding he has continued to use the trailers.

The COMMERCIAL CAR JOURNAL representative asked another user in the same line of business operating a trailer if the company had notified him to like effect. He laughed and said that the company had done no such thing, and, as for the much mooted guarantee, it did not amount to a nickel. "Why, two days after I bought the car it was necessary to make some repairs due to no fault of mine and they stung me good and proper for them. No, sir, their guarantee does not amount to a nickel."

Investigation as to trailers reveals that a few of the makers have as yet had serious cause to consider the subject. One

agent of a well-known standard heavy truck states that his company is investigating the matter but at present is noncommittal as to the advisability of using trailers. But to say the least the action of the concern mentioned above in killing the guarantee is worthy of note.

REPAIRMEN ARE LIABLE FOR DAMAGES DONE WHILE TRYING OUT A CAR

In the case of A. G. Brooker against the F. L. C. Martin Automobile Company in the Supreme Court of New Jersey, it was held that the Martin Company was responsible for the wrecking of Mr. Brooker's car, which was taken out to be tested after repairs were made, the court holding that having taken out the car without instructions by the owner, the defendants did so at their own risk, and were liable for the consequences.

WILLYS BUYS GARFORD PLANT

John M. Willys, President of the Willys-Overland Company, has purchased the plant of the Garford Company, of Elyria, O., manufacturers of the Garford pleasure and commercial cars. The purchase involves the transfer of the $2,000,000 capital stock of the Garford Company. Although the Garford plant will be operated under the same title as heretofore, it will form a part of the new Willys-Overland Company, which is now capitalized at $15,000,000. It is said that A. L. Garford, formerly head of the Garford Company, will retire. Mr. Garford is one of the oldest manufacturers in the automobile business.

WILLYS-OVERLAND COMPANY INCREASES CAPITAL TO $15,000,000.

Announcement has been made that the Willys-Overland Company, of Toledo, O., has increased its capital from $6,000,000 to $15,000,000—$10,000,000 being common stock and $5,000,000 being accumulative 7 per cent. preferred stock. In addition to the Gramm and Garford plants, which the Willys Company have lately acquired, it is supposed to build four new large buildings as an addition to the Toledo plant, and to manufacture 40,000 Overland cars for 1913. The Willys-Overland Company now manufactures the Overland commercial cars as well as the Gramm and Garford cars.

BUILD MARTIN TRACTOR AT INDIANAPOLIS

Henceforth the Martin Tractor, the invention of C. H. Martin, will be manufactured in Indianapolis, Ind., a company having been formed for that purpose and incorporated with an authorized capital of $50,000. Heretofore the Martin Tractor has been built at the Knox factory, at Springfield, Mass.

COMMERCIAL CAR AGENCIES WANTED BY:

DR. J. W. HAWKINS, of Westbury House, Island of Barbados, British West Indies. Truck suitable for hauling sugar cane to be refined.

THE FRUITVALE GARAGE COMPANY, 3420-26 E. 14th Street, Oakland, Cal. This city has a population of 30,000, and requires cars of all capacities of gasoline type.

THE MILLER COMPANY, Room 4, Warden Building, Washington, D. C. Cars wanted of 1000, 1200 and 3000 lb. capacities, selling at $700 and upwards.

NEW COMPANY TO BE KNOWN AS THE GRAMM-BERNSTEIN COMPANY

Announcement has been made that the new company formed by B. A. Gramm, formerly of the Gramm Motor Truck Company, of Lima, O., is to be known as the Gramm-Bernstein Company, also of Lima, O. The new company has been incorporated with $500,000 capital,—$200,000 being seven per cent. preferred, and $300,000 common stock. The officers are: Max Bernstein, President; B. A. Gramm, Vice-president and General Manager; Harry L. Bentley, Secretary, and Fred Biszants, Factory Manager. Mr. Gramm will have the supervision of the production and sales end of the business and Mr. Bernstein will have charge of the finances of the company. The new company will occupy the old plant of the American Strawboard Company, and is already remodeling the buildings and installing machinery. It is expected that the new product will be ready for the market by October.

NEW AUTO PLANT FOR BUFFALO

T. R. Lippard and R. G. Stewart, Vice-President and General Manager, and Secretary and Chief Engineer, respectively, of the Lippard-Stewart Motor Car Company, 1738 Elmwood Avenue, Buffalo, N. Y., withdrew from that organization June 1, and have formed and financed the Stewart Motor Corporation, which will enter the motor truck field on a larger scale. Mr. Lippard is President and General Manager, and Mr. Stewart, Vice-President and Chief Engineer of the new concern. R. P. Lentz, for several years connected with the London & Lancashire Fire Insurance Company, of Hartford, Conn., is Secretary and Treasurer, while Robert W. Ingersoll, recent Manager of the Firestone Tire & Rubber Company, in Buffalo, will be Sales Manager.

The older Company will continue operations in its plant on Elmwood Avenue, under the direction of August Becker, President, and E. J. Barcalo, Treasurer, who have obtained full control through the withdrawal of Mr. Lippard and Mr Stewart.

The new Company has secured the big plant recently vacated by the Niagara Machine & Tool Works, at the corner of Randall and Superior Streets. It will be put into condition for occupancy by the Stewart Motor Corporation immediately. Orders for machinery, equipment, etc., are now being placed from the temporary offices of the Company, at 1056 Ellicott Square. Every effort is being made to start manufacture at the earliest possible moment, so as to fill orders already secured for early Fall delivery.

The Company will manufacture light capacity motor trucks at a moderate price. The new product will be known as the Stewart Truck, being named after R. G. Stewart, the designer and chief engineer, who is also the designer of the Lippard-Stewart Truck.

Both Mr. Lippard and Mr. Stewart were connected with the Franklin Automobile Company, of Syracuse, for several years. They came to Buffalo about one year and a half ago to start the Lippard-Stewart Company.

The reading columns of the "C. C. J." are always open to our readers for discussions or advice on any subject pertaining to the industry, and all communications will be gladly answered by experts on transportation problems. Address "C. C. J." Editorial Department, Forty-ninth and Market Streets, Philadelphia, Pa.

PERSONAL MENTION

COLGATE HOYT, of New York, has resigned as a director of the Pope Manufacturing Company.

B. F. FITCH has been made Chicago Sales Representative of the Autocar Company, of Ardmore, Pa.

EDWARD A. SKAE, president of the Gemmer Manufacturing Company, died on Thursday, June 27th.

ARCHIE D. MACLACHLAN has resigned as sales manager of the Sanford Motor Truck Company, of Syracuse.

HENRY C. COLGAN has succeeded Wright Barr as manager of the Waverley Electric Company, Louisville, Ky.

JEROME INGERSOLL has been appointed manager of the Detroit branch of the Baker Electric Vehicle Company.

HOWARD W. MORGAN, Milwaukee, Wis., has joined the sales force of Buick Motor Car Company as truck salesman.

ALFRED NYE MAYO, treasurer of the Fisk Rubber Company, Chicopee Falls, Mass., died on Wednesday, June 26th.

ROY C. CHIDESTER has been appointed manager of the Packard Motor Car Company's branch, at Milwaukee, Wis.

ALBERT S. HOLLY has become manager of the truck department of Alvan T. Fuller's Boston, Mass., establishment.

R. S. HARTSELL will represent the motor truck tire department of the Detroit branch Goodyear Tire & Rubber Company.

FRANK H. JONES, formerly of the Warner Gear Company, is now general superintendent of the Muncie Gear Works.

HOWARD E. WAGNER, formerly with Wyckoff, Church & Partridge, is now sales manager for the Buffalo Electric Vehicle Company.

GEORGE M. DOUGHERTY, formerly with Lord & Thomas, is now advertising manager of Michigan Buggy Company, of Kalamazoo, Mich.

ARTHUR SMITH, formerly sales manager of the Packard Motor Car Company, of New York, has become sales manager for the A. Elliott Ranney Company.

GEO. STROUT, who has been representing the Grabowsky Power Wagon Company in the East, with headquarters in New York, has resigned his position.

W. J. MEAD

formerly with the Buick and General Motors Company, has resigned from the managership of the Olds Motor Works, to become President and General Manager of the Amplex Motor Car Company, of Mishawaka, Ind., successors to the Simplex Motor Car Company.

FRANK C. RULON, of the Philadelphia branch of the International Motor Company, has been made manager of the Chicago branch of the same company.

BENJAMIN A. RHOADS has been promoted from superintendent to factory manager of the Dayton Motor Car Company, Dayton, O., succeeding J. B. Myers.

C. S. YOUNG has left the Lozier Motor Company and accepted a position with the Regal Motor Car Company, at Detroit, to become assistant general manager.

ARTHUR GIBBONS is now connected with the Truck Sales Department of the Chicago branch of the Velie Motor Vehicle Company.

FRED F. COLVER has been appointed manager of the Truck Department of the New York branch of the Locomobile Company of America.

WRIGHT BARR, of the Waverley Electric Company, Louisville, Ky., has been promoted to the position of special representative for the Waverley factory.

H. R. VOIT, formerly purchasing agent of the Metzger Motor Car Company, has assumed the same position with the Overland Motor Car Company, of Pontiac, Mich.

KARL PROBST, Detroit Mich., formerly with the Lozier Company, has been appointed general manager of the Kanawha Auto Truck Company, of Charlestown, W. Va.

GEORGE MORGAN, formerly Detroit representative of the New Departure Manufacturing Company, is now Indianapolis representative of the Hess Spring & Axle Company.

J. B. MYERS, formerly factory manager of the Dayton Motor Car Company, has been appointed general superintendent of the Marion Motor Car Company, of Indianapolis.

R. J. MACKENZIE, formerly with the Alden Sampson Manufacturing Company, has been appointed purchasing agent for the Kelly Motor Truck Company, Springfield, O.

JOHN A. KINGMAN, Advertising Manager of the Locomobile Company of America, after an extended absence in Europe has recovered his health, and is again at his desk.

MAJOR L. M. FULLER has resigned as general manager and secretary of the Velie Motor Vehicle Company, to go with the Bausch & Lomb Optical Company, of Rochester, N. Y.

J. P. GRIFFIN, formerly of Merchant & Evans, Philadelphia, has joined the sales force of the Enterprise Metal Company, of Syracuse, N. Y., manufacturers of Vanadium Bearing metals.

E. Ralph Estep has resigned as advertising manager of the Packard Motor Car Company at Detroit, Mich. No announcement is made as to his plans for the future.

O. B. HARDWELL, Advertising Manager of the Paige-Detroit Motor Car Company, has resigned. The advertising of the Paige Company will hereafter be looked after by Henry Krohn, sales manager.

OLIVER C. HUTCHINSON, formerly manager of the Marquette Company, has been promoted to general manager of the Olds Motor Works, Lansing, Mich., also occupying the office of Vice President of the Company.

FRANK G. MINER, formerly California agent for the Stearns and Locomobile Companies, has joined the forces of the Kelly Motor Truck Company, and will have charge of the sales in San Francisco and vicinity.

HORACE DE LISSER has resigned as Vice President of the United States Motor Company, to become Chairman of the Board of Directors of the Ajax-Grieb Rubber Company. Mr. De Lisser was formerly manager of the Ajax Company.

R. S. HARTZELL, formerly of the Detroit branch of The Goodyear Tire & Rubber Company, will in the future travel through the state of Michigan, in the interests of the motor truck tire Department of The Goodyear Tire & Rubber Company. Mr. Hartzell will make his headquarters at the Detroit branch.

FRANK P. DAY, manager of the Atlanta branch of the Locomobile Company of America, died Saturday, June 15th, at Atlanta, Ga. Mr. Day was formerly connected with the Sales Department of the same company for six years at its Bridgeport, Conn., factory, and had a wide experience in all branches of the automobile industry, as well as an extensive acquaintance among automobile manufacturers and dealers and the trade generally. He leaves a wife, who is the daughter of a prominent family of Savannah, Ga.

FRANK H. JONES, who for ten years has been General Superintendent for Warner Gear Company, of Muncie, Ind., has resigned to become interested in and associated with Muncie Gear Works as General Superintendent and Mechanical Engineer, and will add to their present production a full line of sliding gear transmissions, control levers and steering devices of the latest possible construction and especially adapted for both pleasure and commercial cars.

G. H. DUCK, New York City, formerly manager of the New York branch of the Matheson Automobile Company, has been appointed manager of the New York Branch of the American Locomotive Company, automobile department, at 1886 Broadway, and will have charge of the local sales of Alco motor trucks and cars. He will also supervise the Service Department in Long Island City.

THE GENERAL VEHICLE COMPANY'S NEW WESTERN MANAGER

Edwin E. Witherby, the new Western manager of the General Vehicle Company, brings to that organization a ripe experience in things electrical. He was head of the E. E. Witherby Company, a New York corporation controlling five different gas and electric properties. The General Vehicle Company is fortunate in being able to add such a man to its selling organization. Mr. Witherby will make his headquarters at the new Chicago office of the General Vehicle Company, in the Otis Building, La Salle & Madison Streets.

THE KRIT MOTOR CAR COMPANY, Detroit, Mich., will in future keep car testers off the streets, having established a test track on an adjacent piece of property.

WILLYS-OVERLAND COMPANY, Toledo, O., held a District Managers' Convention June 20th to 22nd.

NEW BRANCHES

R. & L. COMPANY, Garford distributors in New York, reports the opening of a branch in Brooklyn.

RHINELAND MACHINE WORKS COMPANY, New York City, has opened a western branch and stock room at 1254 Michigan Avenue, Chicago, Ill., in charge of D. D. Davis.

MOTZ TIRE & RUBBER COMPANY has installed a branch in Philadelphia, Pa., due to the rapidly increasing business. It is located at 1409 Race Street, and is in charge of W. M. Stubbs.

REPUBLIC RUBBER COMPANY, Youngstown, O., has opened a branch at 5919 Euclid Avenue, Cleveland, O., with B. C. Swinehart, of the Truck Tire Sales Department, in charge.

GENERAL MOTOR TRUCK COMPANY, of Detroit, Mich., opened a branch at 1121-23 Locust Street, St. Louis, Mo. The St. Louis branch will carry complete stocks of parts of trucks of either gas or electric kind.

W. G. CHANSLOR, of the Chanslor & Lyon Motor Supply Company, San Francisco, Cal., has established a new branch for his company at 627 Washington Street, Portland, Oregon, and will remain there as resident manager.

THE PACKERS MOTOR TRUCK COMPANY, of Wheeling, W. Va., has just opened a branch office at 1784 Broadway, in the U. S. Rubber Building, N. Y. City. This company also conducts a service station on West 42nd Street.

UNIVERSAL MOTOR TRUCK COMPANY, Detroit, Mich., are erecting a service station at 26th Street and S. Park Avenue, Detroit, Mich., 112 x 150 ft., which will be one of the most complete service stations for commercial cars in the country.

THE ELECTRIC STORAGE BATTERY COMPANY, of Philadelphia, Pa., on July 1st, opened a new "Exide" Battery Depot, at 1329 Walnut Street, Kansas City, Mo. At this Depot will be carried complete "Exide," "Hycap-Exide," "Thin-Exide" and "Ironclad-Exide" Batteries for electric vehicles, as well as battery renewals and parts. There will also be carried in stock a complete line of the new "Exide" Battery for automobile lighting and self-starting, as well as the standard "Exide" Battery for gas engine ignition. Including the new Kansas City Depot, The Electric Storage Battery Company now has ten "Exide" Depots—located in Philadelphia, New York, Boston, Cleveland, Chicago, St. Louis, Kansas City, Atlanta, Denver and San Francisco.

CLAIRE L. BARNES & COMPANY, McCormick Building, Chicago, Ill., incorporated in 1910 with a capital of $30,000, one of the most successful and best known of the direct factory representatives in the automobile industry, have recently added three more companies to their list. The new connections comprise, the Union Drop Forge Company, of Chicago, which makes finished crank shafts and drop forgings of all kinds; the Lefever Arms Company, of Syracuse, N. Y., which has been manufacturing the Lefever guns, and is making a specialty of selective transmissions for touring cars; the Federal Pressed Steel Company, of Milwaukee, Wis., which manufactures seamless drawn-steel pressure tanks for air, gas and liquid. The other two concerns represented by this company are the Fort Pitt Steel Casting Company, McKeesport, Pa., makers of small steel castings, and the Simmons Manufacturing Company, of Kenosha, Wis.

Midsummer Meeting of S. A. E. Most Successful in History of Organization

Discussion Aboard Steamer City of Detroit II

THE midsummer meeting of the Society of Automobile Engineers, held June 27, 28 and 29th, is generally regarded as the most successful in the history of the organization. It was a unique gathering in that the discussions were aboard the Steamer City of Detroit II in which the members, with their wives and sisters, embarked for the cruise from Detroit to Mackinac Island and return, which of all the great lake trips is most replete with interest. Many scenes of historical and other note were visited. It was something of a novelty for automobile engineers to discuss design and practice aboard a boat, but it is not recorded that any became seasick doing it nor is it a matter of record that any member returned from the trip having had other than the real, live, interesting session the committee had planned for him.

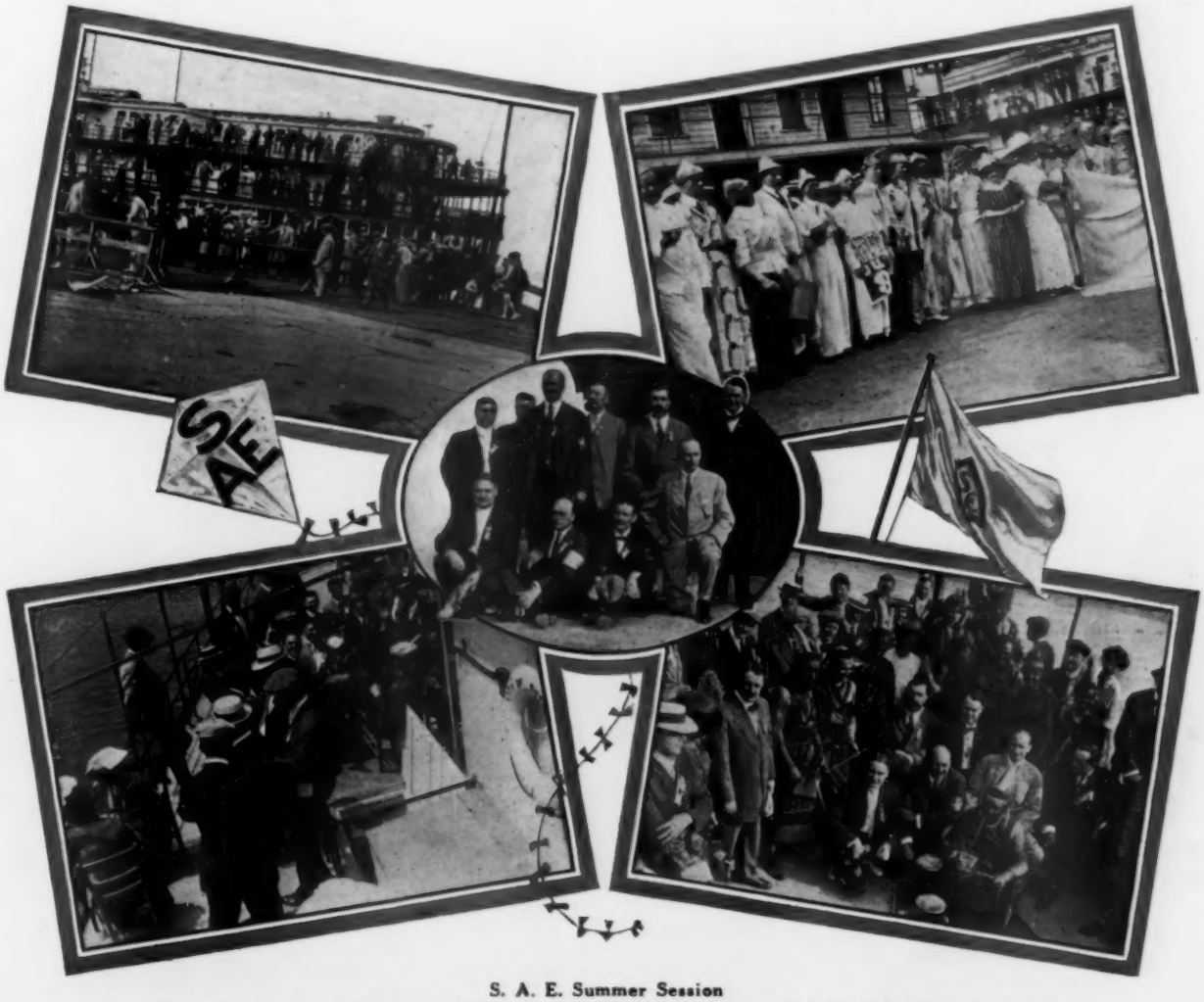
Opening Session

The opening business session of the meeting was held at the assembly hall at the Hotel Ponchartrain where the official headquarters had been established. President Henry F. Donaldson presided and read his report covering the growth of the society during the past season. He showed that the present membership is 1300, about 60 per cent. more than during the midsummer session a year ago. Various other items of kindred interest were touched upon, including the new quarters in New York.

Lord Montague Addresses Meeting

A feature of the morning session was the address given by Lord Montague, a titled British sportsman, automobilist, newspaper correspondent and traveler.

His Lordship made a hit by his unassuming methods and frank manner. President Donaldson had touched upon standardization in his report and this served as the topic for the titled gentleman who is said to be something of a factor in the British industry. In his opening remarks, Lord Montague, who had been the guest of Howard E. Coffin, vice-president



S. A. E. Summer Session

Upper left, members boarding boat for trip to Makinac Island. Upper right, "Mummers" on the deck making fun for the company. Center, groups of officials. Lower left, conversation and lake breezes. Lower right, Indians on deck

of the Hudson Motor Car Company, stated that he esteemed it an honor to be present, inasmuch as his presence constituted representation of the English automobile industry at the S. A. E. Meeting. "I listened," he said, "to your president's address with great interest, as I saw in it reasonable standardization, which we are also endeavoring to attain in England to-day." He called attention to the fact that standardization might be carried too far. He said that on behalf of the English engineers they wish to co-operate in the work of standardization, and were glad to welcome American cars.

Former President Henry Souther spoke on standardization and the treasurer's report was submitted.

Visit the Ford Plant

After lunch the members boarded trolley cars and were conveyed to the mammoth Ford plant at Highland Park. Before entering the office building the members were photographed, this picture being shown herewith. The glad hand was out at the Ford plant and the members were escorted through the factory by guides who showed everything there was to be seen. The methods and processes employed were of great interest to the members. The trip through the big plant and over the Ford grounds occupied nearly two hours. On return to the office the Ford Company played host to perfection

Papers Read

Friday morning there were papers presented at the meeting aboard the steamer. Henry Souther as chairman of the standards committee presented a paper on standardization which proved to be one of the liveliest topics of the midsummer meet. The discussion on this topic occupied considerable time. In fact so much time was required for discussion that all of the papers were not read and some will go over until the mid winter meeting which is to be held at New York next January. Those papers presented were as follows: "Motor Sizes and Drive Ratios for Commercial Vehicles," by Eugene P. Batzell; "A Comprehensive Motor Test," by Herbert Chase; "Standardization and Co-operation in Motor Testing," by Herbert L. Connell; "Worm Gears," by Frank Burgess.

E. T. Birdsall reported the work of the data sheet division in the absence of Chairman Cecil P. Poole. The establishment of a testing laboratory at Detroit was suggested by John C. Heinz, this for the use of the members.

William P. Kennedy as chairman of the committee of truck standards reported that the committee had no new recommendations to offer as regards the wheel dimensions and tire fastening division. The committee has been in communication with truck wheel makers regarding the efforts to standardize.

Reporting for the truck division, Mr. Kennedy stated that the committee was collecting truck specification data. According to information received by the committee from truck wheel makers, about 90 per cent. of the production is built in accordance with the S. A. E. standards.

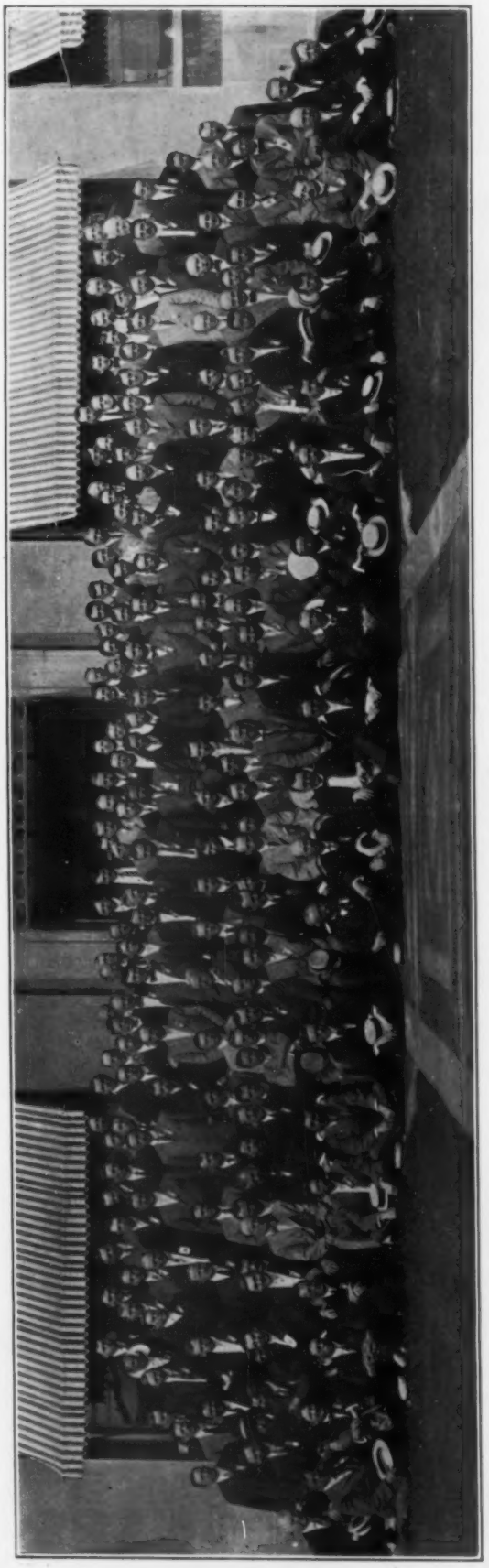
C. W. Spicer reported for the broach division, but owing to the pressure of other business the discussion was deferred until the mid-winter meeting.

The report on carburetor fittings was adopted.

Motor Car for Clarkson

Coker F. Clarkson, secretary and general manager of the society, is very favorably regarded by the Indianapolis section which has been quietly hustling for some time to raise funds to buy the secretary a car.

The two day cruise terminated at Detroit on Saturday evening about 9 o'clock. Detroit hopes to land the next summer meeting of the society.



S. A. E. Members Visiting Ford Plant

This party of automobile engineers was entertained in royal fashion while visiting the mammoth Ford plant

THE COMMERCIAL CAR JOURNAL

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The 1912 Table of Specifications of Commercial Cars will be included in the regular subscription price of $2.00 per year for the Commercial Car Journal until the supply on hand is exhausted.

REORGANIZING THE DELIVERY SYSTEM A CASE FOR THE EFFICIENCY DOCTOR

IT IS not necessary to reiterate the well worn statement, that truck efficiency, other things being equal, is directly proportional to the amount of time the car is in motion. Most users seem to have difficulty in understanding that the truck is a high grade piece of machinery, and that to allow a four or five thousand dollar machine to stand idle, if only a few hours a day, is a very expensive proposition. Notwithstanding this fact we find users everywhere purchasing motor trucks and putting them into service exactly the same way that their horse trucks are operated. While loading and unloading, horses rest, this being absolutely necessary, especially in hot weather, or they could not continue their work, but why subject the mechanical delivery wagon to this same, and in its case, wholly useless delay?

There are several reasons why motor trucks are handled in this short sighted and unbusiness-like manner. In the first place delivery systems as a rule are largely under the control of drivers, or men who have had more or less to do all their lives with the handling of horses and wagons. It is but natural that trucks when put into service with horses and wagons should also be placed under their control. It seems almost impossible to educate the user to the point of realizing that the truck is a high grade piece of machinery and that a man having the highest order of systematizing and reorganizing ability is required to rearrange and adapt the entire delivery system, not only outside of the store, but inside of the store as well, to suit the new method of delivery. There is not one delivery superintendent in fifty that is capable of handling such a reorganizing problem. The case actually demands the attention of an efficiency doctor; in other words, at the beginning the entire delivery system within and without should be systematically gone over, re-arranged, and so planned that the modern mechanical delivery wagon can be kept continuously at work.

In private establishments, and especially such as handle uniform sized packages, goods which always come in the same kind of containers, much can be done to help the motor trucks keep busy. Elevators are apparently one of the greatest offenders; by this we mean, that in a large number of establishments elevators are depended upon entirely for moving the raw product from floor to floor, and for bringing the finished product to the loading platform. While elevators may be all right for miscellaneous products of innumeral sizes and shaped packages, they certainly are out of place when the moving of goods of uniform character is considered. Shoots, slides, traveling belts, traveling chains and other devices are much more rapid and efficient, and when properly installed permit of practically sliding the load direct from the factory floor onto the body of the truck. There is no economy in keeping tied up for an hour a $3,500 investment at every load simply because goods cannot be quickly brought to the point of loading with the present facilities. This is merely one illustration of many which bring out the idea that the entire system within must be re-organized.

In fact many of the buildings will eventually have to be altered to facilitate motor truck delivery. Court ways provided with turn tables, doors sufficiently large to permit the entrance and exit of the largest trucks with enclosed bodies, movable platforms, slides, shutes, traveling belts and other devices for bringing the goods quickly within the reach must be constructed before the maximum work can be obtained from the truck.

It is a notable fact that many of the streets are not suitable for the operation of vehicles any heavier than the ordinary two-horse truck when loaded. Yet modern advancement and developments demand that the streets be capable of handling vehicles weighing, when loaded, fifteen tons. Manhole covers are not heavy enough. The runways to ferry boats, the hoisting mechanism, the small draw bridges, etc., are all too light for modern motor trucks.

Commercial cars are now running any where from 100 to 150 miles in all directions from their source of supply, and it is ridiculous that they should be held up at ferries, at bridges and other places and have to discharge part of their load on account of the antiquated structures still in use.

Is it not time that the architect, the civil engineer, road constructors and ferry boat companies met this matter half way and provided ample and suitable bridges, doorways and ferry boat entrances?

CAUSE AND EFFECT

HE recent action of the Executive Committee of the N. A. A. M. in adopting the recommendation for a caution plate is to be commended and we believe will result in more careful handling of commercial cars. We have advocated for some time that the manufacturers, in their attempt to govern the speed of trucks, adopt a policy of nullifying their contracts wherever excessive speed and overloading is habitually practiced. Such suggestions were made in an editorial "Speed and Load Limits Should be Fixed by the Manufacturers," in our February issue, page 17, and on account of our advocacy of this method, we are more than pleased to note that such measures have been adopted by the N. A. A. M.

Another subject which was suggested by the "COMMERCIAL CAR JOURNAL" was the summer commercial car show, a truck show entirely independent of the pleasure car end of the industry. In an editorial in March, "Separate Commercial Car Shows are Wanted," the need for such an independent show was clearly put before the trade, and the summer or fall was suggested as the most appropriate time. In the May issue in an editorial, "The Commercial Car Shows and Commercial Car Manufacturers' Association," the subject was again put forward and the stand was taken that it was the duty of the National Association of Automobile Manufacturers to arrange a show in conformity with this suggestion.

We are, therefore, again pleased that the N. A. A. M. after a lengthy and favorable discussion of this subject at the Executive Committee Meeting, June 4th, referred the matter of the show to the Commercial Car Committee for consideration. We hope that the matter will be decided in the affirmative, and that the largest and most representative commercial car exhibit yet seen in this country will be arranged for the summer of 1913. It is time the commercial car industry stood alone and will be but a short time before it will outstride its predecessor, the pleasure car industry.

TRUCK PARADE IN PHILADELPHIA LARGEST EVER SEEN

Vehicles in Line Representing Seventy-one Makes

The second commercial car parade of the "Philadelphia Inquirer" took place in Philadelphia on June 20th. The weather being favorable, there was a tremendous turnout, 509 vehicles being in line, representing no less than seventy-one different makes. Every conceivable type of body was represented, including special lumber trucks, coal trucks, dumping-body sand trucks, tank wagons, moving vans, horse ambulances, ambulances for dogs, S. P. C. A. water wagon, and even diminutive industrial trucks, with wheels so small that it did not seem possible they could operate successfully on country roads.

The line of march took the cars down Broad Street, both directions on Market Street, through the wholesale districts of Water & Front Streets, and out through the suburban section to Belmont Driving Park, where the cars were parked, supposedly to be inspected by interested business men.

The parade was divided into five divisions: The first, trucks of 7000 lbs. capacity or over; second division, 4000 to 6900; third, 2100 to 3900; fourth, light delivery wagons, 2000 lbs. or less, and the fifth division was made up of electrics of all sizes and types. At the head of each division were the largest trucks, which prevented speeding, and kept the parade together. The very long gaps usually found in truck parades were not noticeable, which gave the affair very much more the aspect of a parade than is usual in such events. The cars followed each other almost too closely, and that radiators were not damaged was due to the efficient brakes and skillful handling of the drivers, many of the cars stopping within three inches of the car ahead.

There were several new trucks in the line, notably the Sharon, an entirely new product now being manufactured by the Driggs-Seabury Ordnance Corporation, of Seabury, Pa., and the Kendle, a friction-driven truck manufactured by the Kendle Motor Car Company, Philadelphia. The friction drive is unique, consisting of V-edged fibre rings engaging corresponding grooves in metal wheels. These are very similar to the Duryea engagement, but are fibre to metal, instead of metal to metal. Another notable feature of the transmission is the fact that it provides a direct drive on the high speed only, the two lower speeds and reverse being friction. The stripped chassis was shown in the parade, allowing inspection of the working parts while in operation. A small electric industrial truck was entered by the Woods Electric Garage, this machine being the product of the Automatic Transportation Company, Buffalo. This little truck has a maximum speed of ten miles per hour, and a load capacity of 2000 lbs. A large Alco truck, owned by Charles W. Young & Company, of Philadelphia, made its start for a cross-continental trip at the close of the parade, after following the line of march. This car is fitted with an all-steel body made by a special process of oxy-acetylene welding, by the Hale & Kilburn Company, Philadelphia. It is carrying a full ton overload of soap. The vehicle, with its signs, attracted much attention.

The parade was well conducted, and reflects credit on the management. A committee of the Philadelphia Automobile Trade Association assisted the "Inquirer" in this matter. This committee consisted of W. H. Metcalf, Woods Electric Garage; William F. Roth, Packard Motor Car Company; C. H. Spencer, Autocar Company; A. V. Cabine, Longstreth Motor Car Company, and C. Robert Hoyme, International Motor Truck Company.

It is unfortunate that the cars have to be parked at such an inaccessible place as Belmont Park. This park cannot be reached comfortably without an automobile or carriage, as it is not on any car line, and is fully a mile from the nearest railroad station. Undoubtedly many business men that might otherwise be interested in looking over the various types of vehicles, did not do so on account of the inaccessible location of the park. The suggestion is herewith made that the parade, which has become an annual affair, could be made very much more valuable to the commercial car agents if a parking space could be arranged on one of the wide streets near the business section of the city.

VIEWS OF THE "PHILADELPHIA

No. 1. Head of the "Philadelphia Inquirer's" Truck Parade on Broad Street.

No 2. Parade passing "Inquirer's" office; heavy trucks leading in each division.

No. 3. Cars parked at Belmont Race Track, after completing the parade.

No. 4. Chas. W. Young & Company's Alco truck, which is now crossing the continent.

No. 5. An electric industrial truck, manufactured by the Automatic Transportation Company, Buffalo, N. Y.; its capacity is two thousand pounds. It made the run without difficulty, and part of the time towed another truck.

INQUIRER'S" TRUCK PARADE

No. 6. The Sharon Truck, just placed on the market by the Driggs-Seabury Ordance Company, Sharon, Pa.

No. 7. Bidding farewell to the driver of the Chas. W. Young Alco truck just before leaving the race track for its long cross-continental trip.

No. 8. The new Kendle friction-driven truck made by the Kendle Motor Car Company, Phila. This friction transmission gives a direct drive on the high speed.

NEW FACTORIES AND TRUCKS

Mack Truck Company is in new quarters at 3430 Lindell Avenue, St. Louis, Mo.

Selden Motor Vehicle Company, Rochester, N. Y., is placing a one ton commercial car on the market.

G. & J. Tire Company, Indianapolis, Ind., are starting on the erection of a five-story addition to their building, 170 x 220 ft.

R. C. H. Corporation have purchased eight acres of land adjoining their present holdings on which to build additions to the factory.

Racine Manufacturing Company, Racine, Wis., manufacturers of bodies and trimmings, is building two large additions to its plant.

Ford Motor Company, of Canada, has purchased the plot of ground adjoining its plant, in Walkersville, Ontario, and will erect a four-story addition 75 x 510 ft.

Pratt, Carter, Sigsbee & Company, Detroit, Mich., are about to move into a large factory, and manufacture their Wolverine Commercial car on a large scale.

Fred L. Siebert, motor truck and carriage manufacturer, 530-32 Ontario Street, Toledo, O., secured a permit to built a $10,000 three story brick building on Southard Avenue.

Brennan Motor Manufacturing Company, 103 Grape Street, Syracuse, N. Y., has added a motor truck department to its plant, and will build two, three and five-ton trucks.

Durant-Dort Carriage Company, Flint, Mich., it is stated will manufacture a six cylinder popular priced car in addition to the light delivery car which they are now putting out.

The Poss Motor Truck Company, of Detroit, will shortly be housed in the old Brush plant. The transfer from the old plant will occur immediately. The new location is in readiness.

The Castle Lamp Company, Amesbury, Mass., has purchased a plant at Battle Creek, Mich., which has a floor space of 75,000 sq. ft. E. F. Castle will remove to that city and direct the business.

Goodyear Tire & Rubber Company, Akron, O., will install additional equipment for the manufacture of all types of tires and a complete wheel shop will be installed in all the important branches of the company to give truck owners every facility to make quick changes.

Locomobile Company of America, Bridgeport, Conn., is erecting a new building which is to be used for the construction of its commercial vehicles. The trucks will be constructed in the regular department of the factory until the building is finished.

Hess-Bright Manufacturing Company, on account of the rapid growth of its buisiness, has transferred its office to its new factory, at Front Street & Erie Avenue, Philadelphia, Pa. Removal of the manufacturing department of the business will be performed progressively during the month of July.

Metzger Motor Company, of Detroit, Mich., has extensive additions to its plant under consideration, in addition to the second half of the new building in the rear which is under way. Additional stories to all the factory buildings and a huge office on adjoining property are said to be among the plans.

E. B. Van Wagner Manufacturing Company, Syracuse, N. Y., has completed a new addition to its factory, which will greatly increase its facilities for experiments and tests, and also its product of die castings. L. D. Sullivan, formerly with the Crocker-Wheeler Company, is now in charge of their experimental department.

New Incorporations and Increases

Moore Motor Truck Company, Toledo, O., has increased its capital stock from $15,000 to $200,000.

Mogul Motor Truck Company, Chicago, Ill., has increased its capital from $125,000 to $500,000.

Johns Motor Truck Company has been incorporated in Detroit, Mich., with a capital stock of $20,000.

B. M. O. Motor Truck Company, Cleveland, O., has changed its name to the Standard Motor Truck Company.

Sanford-Herbert Company, Syracuse, N. Y., has been succeeded by the Sanford Motor Truck Company, which has been organized with double the capital of the old company.

Pitt Motor Truck Company, Pittsburg, Pa., has been organized to manufacture commercial motor cars, with a capital stock of $200,000. The incorporators are J. E. Douglas, E. P. Douglass, W. S. Phillips, F. R. Brandt and J. McCalmont.

Cleburn Motor Company, Niagara Falls, N. Y., has been organized to manufacture a 1000 lb. electric delivery wagon. The moving spirits in this organization are C. McKay Hepburn of the Niagara Lead & Battery Company, and J. Clark, of the Clark Motor Company.

The K. D. Motor Company has been incorporated with $100,000 capital, to manufacture the K. D. Crescent Valve Motor. The incorporators are: Miss M. E. Knight, inventor of the motor, President; Mrs. A. M. Davidson, Vice President, and Miss B. M. Davidson, Secretary and Treasurer.

Financial Affairs

Findlay Motor Company, Findlay, O., plant offered for sale by trustee on June 7th, was not sold because of lack of bidders.

In the suit of the Owen Motor Car Company against the Reo Motor Truck Company, for $500,000, the jury was discharged after it had failed to bring in a verdict after twenty-two hours' deliberation.

American Automobile Manufacturing Company, New Albany, Ind.—Plant has been sold by the receiver, L. A. Boli, who purchased it for the American Automobile Corporation for $17,500, subject to a mortgage and other claims, which brings the total price up to $45,000. The new concern will continue the manufacture of the Jonz commercial cars.

American Motor Truck Company, Detroit, Mich., stockholders may have to take a hand in settling up the $15,000 liabilities the company accumulated without accomplishing anything else. Little was paid in on $100,000 of stock issued, and the Detroit Trust Company has been appointed trustee in bankruptcy to see if anything more can be collected from subscribers.

What Grocers Are Doing With Commercial Cars

Examples of Successful Service

BY E. S. FOLJAMBE

THE use of commercial cars by grocery houses along with other branches of business is increasing by leaps and bounds, city delivery being essentially short runs with many stops, admittedly one of the hardest fields for the motor-driven truck to compete with horses, and has not been invaded by motor delivery wagons to anything like the extent that the suburban field has been occupied. In other words, nearly all of the trucks used by grocery houses are operating in their suburban delivery where formerly relays of horses were used.

People are living more and more out of the city, largely due to the rapid transportation supplied by automobile, suburban trolley lines, and suburban accommodation trains, so that many grocery houses find their old established trade no longer within three or four miles, as of old, but scattered all over the suburbs, the territory embracing a circle of fifty miles in diameter. They are now coping with the problem of supplying efficient delivery service over this enormous extent of territory. These suburbanites are used to automobiles, and they expect motor delivery and are impatient of delays. In other words, they demand more than in the past. In fact, many have given up their city houses entirely, living eight months of the year in the suburbs and the other four months at hotels in the city. The motor delivery wagon is apparently the only hope of the grocer for this field.

Grocers, as a rule, seem to be showing the proper attitude toward the new method of delivery, and are keeping accurate accounts of cost of operation so that wherever the figures can be obtained they are apparently authentic.

Mitchell, Fletcher & Company, a well-known grocery house of Philadelphia, use autocars for their suburban delivery work, and each of these cars do the work of from six to seven horses, covering from thirty-five to sixty-five miles per day per car. On Fridays and Saturdays, before the cars were installed, two two-horse teams had to be put up at a hotel at Ardmore, and a three-horse van was loaded at three o'clock in the morning and driven out to them so that they could distribute the goods to the individual homes. This company figured two years ago that it cost them to maintain a horse, $1 per day, including veterinary, feed, and every item connected with the proper maintenance of horse service. This figure is undoubtedly low for the present time, as the cost of feed has greatly increased. However, admitting this figure, to care for these five horses for one day would cost $5 or more, lodging for three men $6 more, making $11, without any incidentals whatever. With motor delivery, of course, all this is done away with, and the trucks deliver direct from the store. As usual with suburban horse delivery, four horses were supplied with each wagon, two horses working alternate days.

The following is a record of the cost of operation of one of the 1½-ton Autocars, for a period of 17.63 months, practically a year and a half, up to January 1st, 1912:

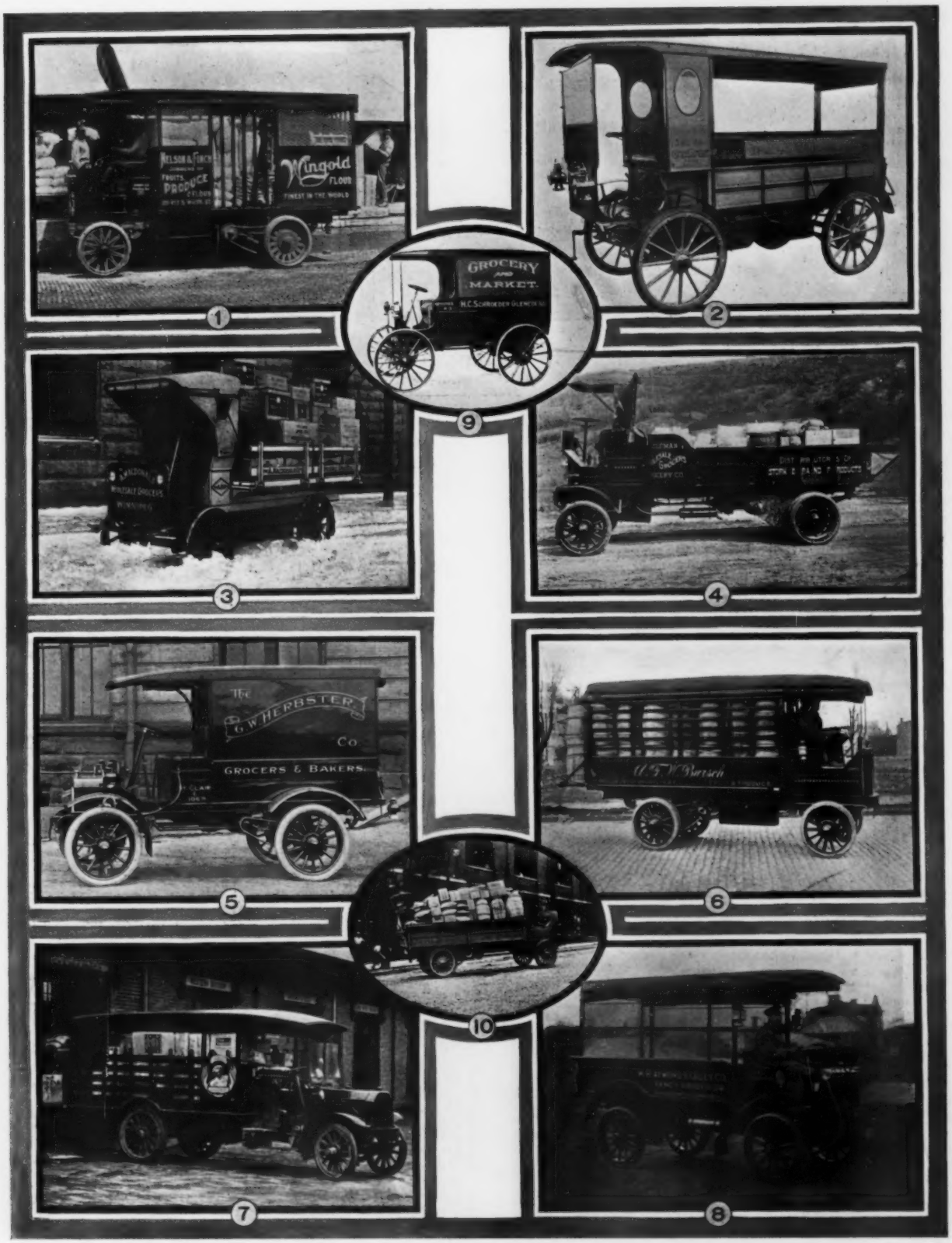
Record for Eighteen Months

Sundries	$35.80
Repairs and replacements	488.52
Tires	598.33
Gas, oil and grease, approximately	296.44
Insurance	261.63
Rent for stable	119.94
Washing	22.50
Total	$1,823.16
Running cost per month	103.42
Depreciation	50.00
The total running cost per month..	$153.42
Cost of maintaining six horses one month	180.00
Saving per car per month over horses..	$27.00

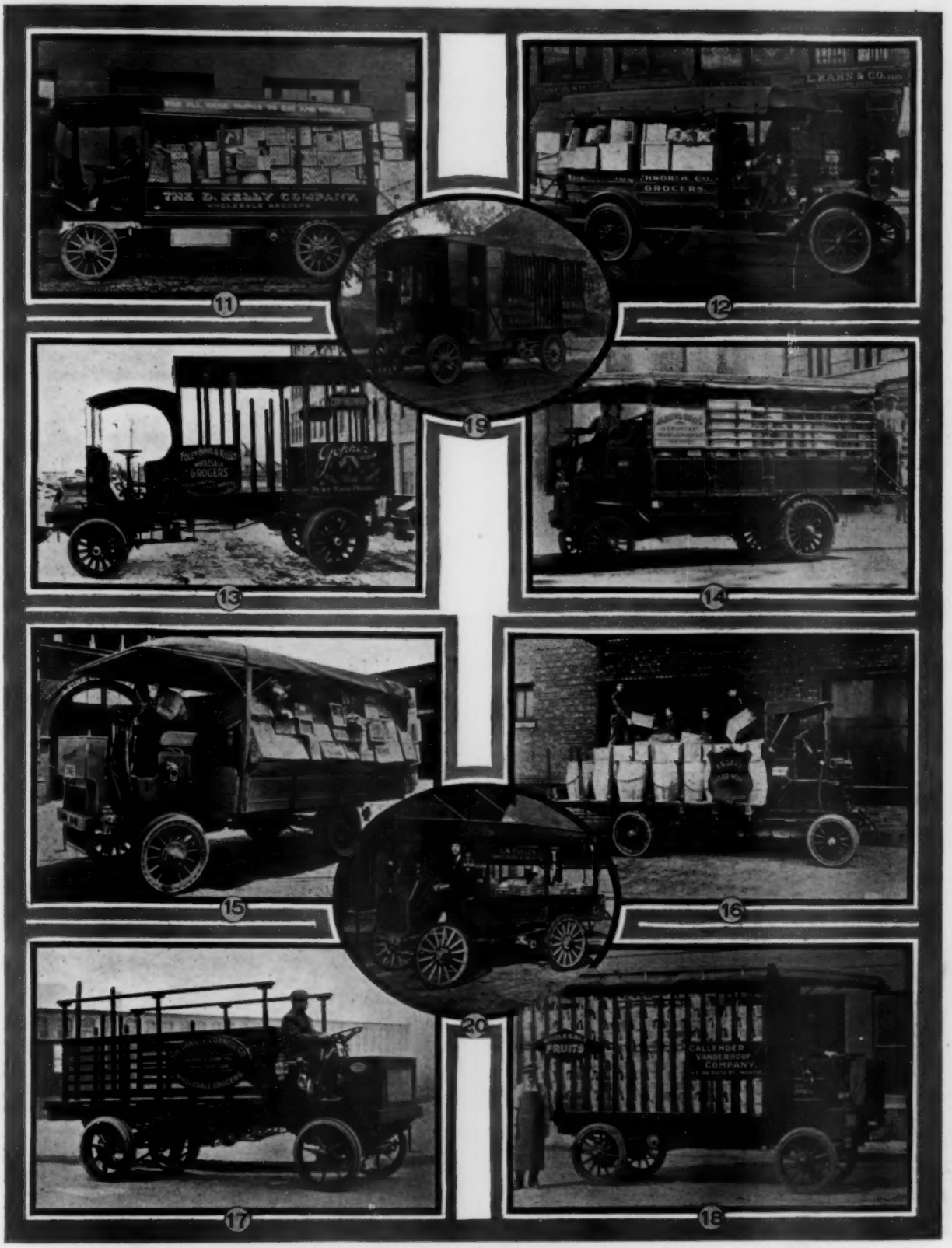
This company is, therefore, saving on each car in the neighborhood of $324 per year over former methods, and the management state freely that they are doing work which the horses could not possibly do, and that their business has

Suburban Grocery Delivery by Motor

Mitchell, Fletcher & Company's Autocars loading at the store and delivering at a suburban point. All cars are fitted with recording instruments, showing speed, time and duration of each stop



No. 1. Avery Truck in use by Nelson & Finch, at Peoria, Ill., receiving load from the side. No. 2. Type of body on small wagons, popular with grocers, car shown being a Veerac in use in chicago. No. 3. A Detroit Electric which has been giving good service, in all kinds of weather, to A. MacDonald, wholesale grocer, Winnipeg, Can. No. 4. Three-ton Knox in use in Springfield, makes round trips to Holyoke, Mass., a distance of eighteen miles, three times a day. No. 5. Fifteen hundred pound Mora, used with much success, by G. W. Herbster Company, Cleveland, Ohio. No. 6. Knickerbocker Truck with drop side curtains, used by A. W. Bursch, Brooklyn, N. Y. No. 7. Three-ton Peerless Truck used by Berdan & Company, Toledo, Ohio, being loaded at the freight station. No. 8. Type of screen body with top and side curtains supplied on the Autocar. No. 9. One thousand pound Mercury, one of the smallest grocery wagons, which is displacing two horses, and saving the owner fifty per cent. No. 10. Three-ton Durable Dayton in use by a wholesale grocery company in Cincinnati, Ohio.



No. 11. Kelly Truck used by a wholesale grocer of Columbus, Ohio. Note the protection at the front for the driver. No. 12. White one and a half ton gasoline truck used by W. P. Southworth Company, Cleveland, Ohio. Attention is called to the dual pneumatic equipment on the rear wheels. No. 13. Grabowsky Truck used by Foley Brothers & Kelly, wholesale grocers, of St. Paul, Minn. Operated successfully through unbroken roads covered with two feet of snow, with temperature thirty-six degrees below zero. No. 14. Mack Truck used by Jaburg Brothers, New York. No. 15. Four-ton Speedwell, in use by Burns Brothers, Cincinnati, Ohio, making a regular trip, which formerly took horses half a day, in one hour and forty minutes, carrying as high as twenty-five barrels of sugar in one load. No. 16. Sampson four-ton truck, one of five used by W. H. Edgar Sugar House, Detroit, running between refineries, freight yards and warehouses. No. 17. Morgan three-ton truck used by Daniels, Cornell Company, Worcester, Mass. Note the big stake body. No. 18. Gopher Truck, fifteen hundred pounds, in use in Minneapolis, fully loaded with grapes. No. 19. E. P. Stacy & Sons' Avery Truck with special body, showing the enclosed front of cab. No. 20. L. W. Tulley's Little Giant delivering groceries to the country, and bringing back produce, regardless of weather conditions.

been greatly increased in suburban districts, owing to their ability to get the goods quickly to these outlying points.

An Example of the Proper Way to Motorize the Delivery

The experience of another well-known grocery house in a large city is a fair example of the results obtained where correct methods have been employed. This firm began by using one autocar for six months, and then two more autocars from the Autocar Service Department. Occasionally another extra car was used during the rush seasons, all of these cars being used on suburban work. During this period they were experimenting, sizing up motor delivery, as it were. On each of these cars the drivers were supplied by the Autocar people, and the trucks were charged for at a minimum rate of $300 per month each. This however, was often exceeded as the minimum limit time was exceeded. Last December the company purchased a 1½-ton Autocar, using 3½-in. solid tires on the front and 4-in. on the rear, and on March 1st they placed two more in service, making three in all, which they now operate themselves.

On the three cars first rented they placed their men as helpers, and these men, old horse drivers, and thoroughly familiar with the delivery business, handled all of the goods, the Autocar Company's drivers doing nothing but driving. These three men became the drivers of the newly-purchased trucks, and three boys were given them as helpers. Their previous experience on the trucks was invaluable, and they proved to be exceptionally good drivers. They were given one week's instruction by the Autocar drivers, their wages were advanced to $15 a week, and the man in charge gave them instructions, calling attention to the fact that they were not operating a plaything, but a very expensive piece of machinery, for the condition of which they were to be held responsible, that they were to oil it, and care for it according to instructions.

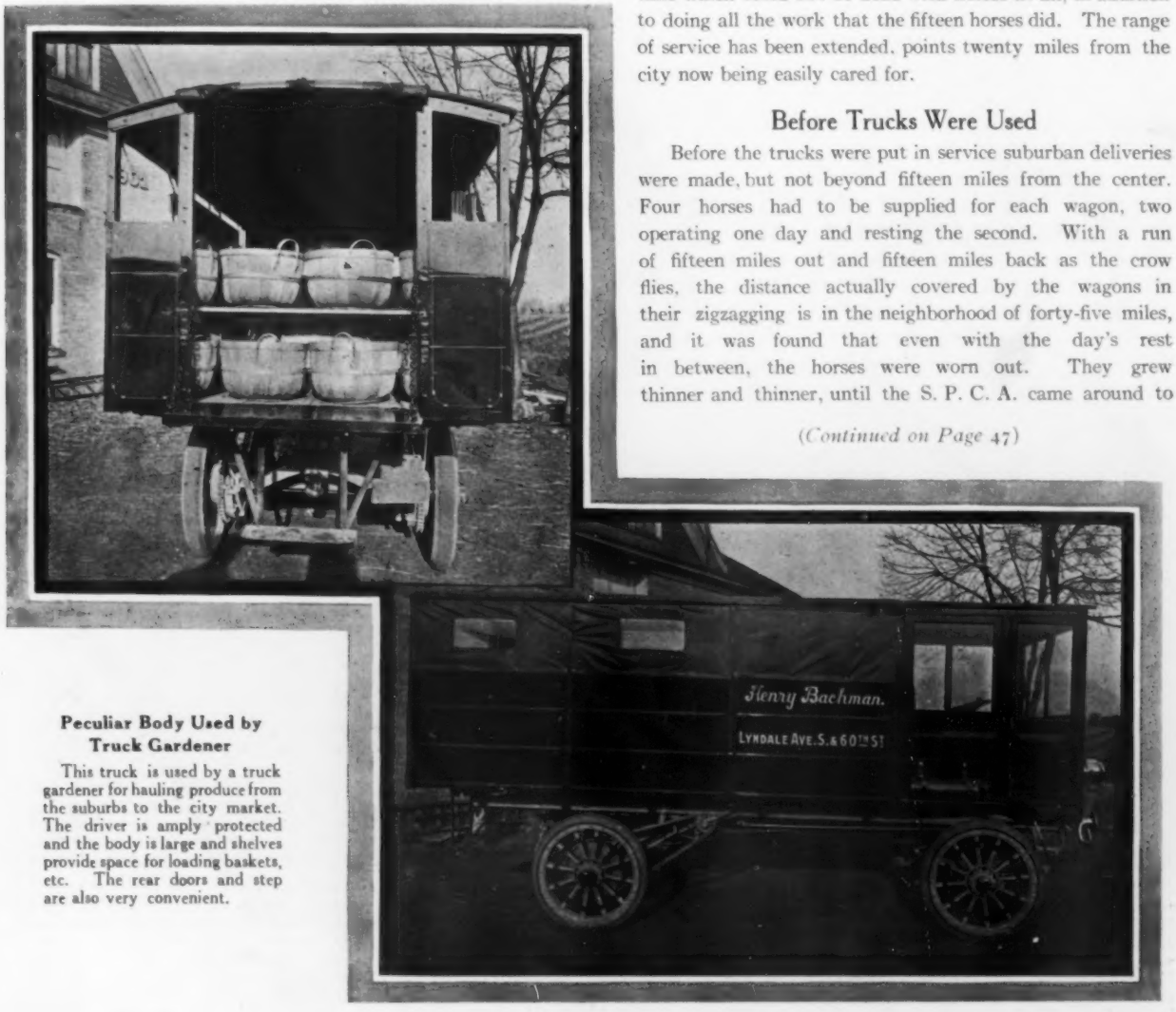
These drivers do not repair the cars, but keep them clean, adjusted and properly lubricated. It has been the experience of many that horse drivers, familiar with the arrangement of packages and routes, make the best commercial car operators, as was shown in this instance.

The cars are garaged with the regular wagons, eight horses still being used for city work, while fifteen have been disposed of on account of the three Autocars. In other words, each of these cars displaced five horses. This, however, is not a fair comparison, because they are doing work at the present time which could not be done with horses at all, in addition to doing all the work that the fifteen horses did. The range of service has been extended, points twenty miles from the city now being easily cared for.

Before Trucks Were Used

Before the trucks were put in service suburban deliveries were made, but not beyond fifteen miles from the center. Four horses had to be supplied for each wagon, two operating one day and resting the second. With a run of fifteen miles out and fifteen miles back as the crow flies, the distance actually covered by the wagons in their zigzagging is in the neighborhood of forty-five miles, and it was found that even with the day's rest in between, the horses were worn out. They grew thinner and thinner, until the S. P. C. A. came around to

(Continued on Page 47)



Peculiar Body Used by Truck Gardener

This truck is used by a truck gardener for hauling produce from the suburbs to the city market. The driver is amply protected and the body is large and shelves provide space for loading baskets, etc. The rear doors and step are also very convenient.

Use of Commercial Cars by Transfer and Express Companies

A Proof That Goods Can Be Moved Cheaper by Power Than by Horse

BY E. S FOLJAMBE

(Continued from June Issue)

Hauling Bricks in California

The Dillon Teaming Company, San Francisco, Cal., has been using two five-ton Durable Dayton trucks for the past six months.

These trucks are working in and about San Francisco hauling brick to the Persidio. They are equipped with side-dumping bodies and carry 2000 bricks to the load, weighing 12,000 lbs. The haul is a distance of 7 miles, mostly up hill. The trucks make three trips daily hauling 6000 bricks, while with the teams, they carried only 1000 bricks to the load and made only one trip per day. At the present time they are using somewhere near 100 horses. They garage their own trucks and figure depreciation at about 20 per cent. Below are given figures on the cost per year, based on what it has cost to operate the trucks since they have had them, and the estimated depreciation and other items which cannot be definitely fixed at this time.

The five-ton truck with body and freight added cost $5000.

Interest on $5000 at 6 per cent.		$300.00
Maintenance of wearing parts $1.50 per day		450.00
Tires, based on 40 miles per day		720.00
Garage (keep trucks themselves but estimate $15 per month)		180.00
Insurance		300.00
Gasoline at 14 cents		336.00
Oil 35 cents		80.00
Operator		1200.00
License		10.00
Depreciation at 20 per cent.		800.00
Total cost per year (300 days)		$4475.00
Cost of truck per day		14.92
One truck does the work of six teams.		
6 teams at $6.00 per day	$36.00	
	14.92	
Saving per day		$21.08
Saving per month of 25 working days		$527.00

The Dillon Teaming Company says that if the trucks continue to work as they have in the past they will pay for themselves inside of ten months.

Long Distance Moving

Long distance moving by truck is growing very rapidly in popularity. A single loading and a final unloading as compared to, loading at the house, unloading at the freight station, loading on the train, unloading at the station, loading onto wagons again and unloading at the house, to say nothing of the fact that expensive crating is eliminated and goods are less damaged, are probably responsible.

L. Curth and Sons, Fulton Street, Brooklyn, N. Y., have for some years been using motor vans for this class of service, household furniture moving being their specialty. This company is now using eight ½ and 3-ton trucks, and has done away with 22 horses and 7 wagons, originally having had 52 horses and 25 wagons. The earnings of the motor driven vehicles are very much greater. While 50 to 60 miles was the limit with horses, the trucks can make 125 to 150 miles a day without difficulty. The head of this firm says, "We find that the autos have increased our business immensely, and we could not go with horses where we have gone with the automobiles."

A Remarkable Showing

The Millbourne Moving and Storage Company, 4950 Folsom Street, Philadelphia, has been using a 3-ton Mack truck with no less than remarkable results. This company started in with the idea that the machine had no heart or soul and could not be tired out. On this basis it has been driven in the last two months 4,000 miles, most of which was through New Jersey, Pennsylvania, Delaware and New York, with the roads in extremely bad shape from the continuous rains. A crew of four to five men, including the driver, and occasionally six

Dumping Body for Bricks

This Dayton truck is used for hauling bricks, by the Dillon Teaming Company, and makes three trips daily, carrying six thousand bricks in all, against horses' one trip carrying one thousand bricks. The saving shown is $527 per month. (See costs in text)

men, accompany the truck to facilitate loading. The following is a brief statement of costs during this period:

A Phenomenal Two Months' Record

Distance traveled 4,000 miles.
Income from truck $2450.

Costs.

Oil	$90.00
Gasoline	235.00
Wages	600.00
Ferriage	22.40
Toll	42.00
Depreciation	675.00
Repairs	none
Total cost	$1664.40
Net profit in 2 months	785.60

There is no cost for garaging, as the truck is run into one of the storehouses and has caused no extra expense for this item. Thus far, as the list shows, not a cent has been paid for repairs of any kind, but amortization is being figured at $100 per annum, in other words if the truck lasts until the end of the year its original cost will be written off, and at the same rate of earning this one machine will net $4,713 to its owners in one year.

Although amortization is set at such a high figure that the owners could throw the truck away at the end of a year, it is safe to say that even driving the truck to the limit, as is being done, will not put it out of commission in that time. If it runs after the year its earning capacity will almost be doubled.

A Record Load

In the accompanying illustrations are shown this truck taking on a load, and as the driver said, "Believe me, this will be some load." The street was narrow, likewise the sidewalk, and the tailboard reached the porch of the house. The load was stowed very securely and the van packed to the top. After the tailboard was reached the machine was driven out into the street and a slat-like extension, some 8 ft. in length, was placed with one end resting on the tailboard and the other temporarily supported by saw horses. Upon this extension was then loaded and securely roped, what would easily have formed a very large load for a single horse wagon. The end of the extension was then roped up to the top of the van and for good measure a couple of box springs were placed even on top of the van.

Where the load is more than can be cared for even when using the 8 ft. extension one of the old two horse, 3,500 lb. capacity wagons, is used as a trailer. In fact on this trip the trailer was present to receive its share if necessary, but it was found that the entire load could be handled without it, and it was therefore left behind to be picked up on the return trip. This enormous load was carried to Atlantic City, a distance of 60 miles, the same afternoon, and another load of goods taken on and brought back to Philadelphia. The truck then started by moonlight for New York with another load of goods to be delivered to 111th Street. The next day the truck returned loaded to Philadelphia and as soon as the load could be disposed of and another taken on, it started for Avondale, some 35 or 40 miles south of Philadelphia. This is the kind of schedule it has been operating on for over two months. By changing drivers and part of the crew the car has been kept in continuous operation, except of course when standing receiving or discharging goods. This company states that in the near future another truck will be added, as the business brought by this one machine is very rapidly increasing.

Some Load

These two pictures show what is being done by a Philadelphia company, with a three-ton Mack truck. At the left the machine is shown being loaded directly from the porch of the house, while a trailer, an ordinary two-horse van, not shown, is held in reserve. On the right is shown the use of a temporary extension, about 8 ft. in length, on which practically a wagonload of furniture was placed. The outer end was temporarily rested upon saw horses while receiving the furniture and afterward roped up to the top of the van. This load was taken sixty miles to Atlantic City.

Electrics in Express Service

Of all users of electrics, probably the most experienced is the American Express Company. Very early in the automobile industry this company began to experiment with motor driven vehicles in its service. In 1907 one electric was placed in service. At this time they were using about 1,600 horses, and for stables about 25 buildings in various parts of New York City. There was no thought apparently of any radical change. During the following year some gasoline trucks were tried and in 1909 fifteen 3-ton gas trucks and four electrics were purchased.

After keeping careful records of the performance of these vehicles this company arrived at the same conclusion at which others have since arrived, namely, that the gasoline machines are peculiarly fitted for heavy long hauls between depots, while the electrics are more suited to pick-ups and delivery work where many stops have to be made. As a result of these tests, twenty gasoline cars and a fleet of seventy-five electrics were

Fleet of Fourteen G.V. Electric Trucks

These trucks are used by the American Express Company, Baltimore, Md. This well-known firm is now using sixty-two of these electrics

ordered in 1911, making now a fleet of forty gasoline cars and eighty electrics. Owing to the large increase in business the company is still operating in addition to this large fleet of motor trucks, 1,300 horses.

At the present time this company is running close to 150 machines and it is said preparations are being made for the addition of another hundred in the very near future. Changes are being made in the company's new building on 42nd Street, making it into an electric garage, the second floor of which is being arranged to accommodate one hundred electrics. There are four 6-ton electric elevators and charging board with one hundred outlets and conduits, leading to one hundred charging plugs, have been run to points on the floor. Annunciators will indicate when each battery is charged, thus signalling the operator to throw off the switch.

Use Horse Drivers

This company finds that the best service is rendered by the horse drivers, who are familiar with the districts of the city and with the requirements of this kind of service. Where a driver showed apt mechanical ability he was placed on a gasoline machine, while the other drivers manned the electrics.

To care for a large number of motor trucks, the seven-story building at 215 West 43rd Street, formerly a stable, was converted into a garage, and here part of the electrics are charged each night. Among the electrics are about sixty-two G. V. trucks and fifty or more Baker electrics.

In the down-town district, the average mileage of each car is eighteen miles per day as the district is so congested and stops so frequent that greater radius of action is out of the question. Thirty-five miles a day has been found the average per car in the up-town district.

All the Baker trucks running in the American Express service are rated at a normal load capacity of four to five thousand pounds. The average rate of the load carried by them is about twenty-five hundred pounds, as express goods are of a bulky rather than a weighty nature. According to Mr. Christie, superintendent of deliveries of the American

Fleet of Baker Electrics Used by American Express Company

These cars are used winter and summer and probably in as hard and continuous service as cars in any class of business

Alco Express Trucks Used on Long Island
Part of a fleet of twenty Alco three and a half ton trucks used by the Long Island Express Company

Express Companies in New York City, it is impossible to definitely tell the number of stops and the number of packages carried on the up-town deliveries in which the cars run as high as 110th Street. The stops in this delivery district number approximately, he says, 120 or more a day. In the down-town deliveries which liberate to the South Ferry their stops are few and the men work out in the street collecting packages, so that he says it is impossible to give any package delivery record in this delivery district. Rapid changes in delivery service which the express companies are making at the present time may seem radical to many. But those who are familiar with the inside situation know that the action of the express companies in adopting trucks, was made after years of deliberation, investigation and a thorough process of elimination.

The magnitude of the business done by the American is shown by the daily average of 30,000 packages picked up and shipped to out of town points and the receiving and delivering in the city of over 15,000 packages per day to say nothing of 15,000 packages handled in the local business.

The Westcott Express Company, of New York, which is owned by the American, has five electric trucks in its service and is planning further extension of its motor car equipment, having recently replaced horse drawn cabs in its railroad station service with 83 gasoline cars. They are also using quite a number of large Alco gasoline trucks.

The Adams Express Company is also a large user of trucks, particularly electrics, having 400 in use and about 50 gas trucks. This company recently purchased thirty-seven G. V. electrics, making 124 machines of this make in operation and several of these are over ten years old and are in use in Rochester, Brooklyn and Indianapolis, the new one going into service in Philadelphia. Thirty-five Commercial Truck Company of America's electric vehicles were purchased at the same time, ten of these being 1-ton capacity, and twenty-five of them 2-ton for use in Philadelphia.

The Philadelphia branch recently issued a permit to convert its stables on Twenty-second street below Market into a garage to care for the large number of trucks now in use. It is understood that very few horses are to be retained when the conversion is completed.

The large increase in recent sales of electric trucks to the express companies is a very accurate index of the efficiency of motor driven vehicles in the express business.

LUMBER AND FEED MAN USES COMMERCIAL CAR

A One and a Half Ton Sampson That Displaces Two Teams of Horses and Costs Less Than One

That commercial cars can be put to good use in hauling different lines of goods is well borne out in the instance of the 1½ ton Sampson shown in the illustration. This vehicle is used by Edward F. Bracken, a dealer in lumber, coal and feed at Paoli, Pa. Mr. Bracken uses the truck principally for the cartage of hay, straw and feed, but he also makes use of it for shingles, sash, lath and other forms of lumber not in great lengths. Mr. Bracken told our correspondent that the car averaged 60 miles per day and had not been laid up one day since its purchase several months ago.

The driver is a very careful man who has had several years of experience with pleasure cars and he knows automobiles from A to Z. The car is rated to carry a load of 1½ tons and the driver absolutely refuses to carry more than 3100 lbs. With a man as careful and trustworthy as this, the depreciation on the truck and tire expenses are sure to be very low. In fact, after several months' use, the Firestone tires look like new ones in spite of their mileage. Even careful examination failed to disclose any serious cuts in the tread and the sides were as if fresh from the factory. How many solid tires we see after a few weeks' use that look fit for the scrap heap. There's a reason.

Mr. Bracken expects to purchase another car when the increase in his business demands it. He says that the car does the work of two horse teams at less than the cost of one for hauls of 2 miles or more, but that for short hauls about town the horse is still in the lead economically speaking. The reason for this is that the stops in such cases are usually longer than the runs and a car earns money for its owner while on the go, but loses money while stopped. Therefore the longer the runs and the shorter the stops, the greater the profit in the commercial car.

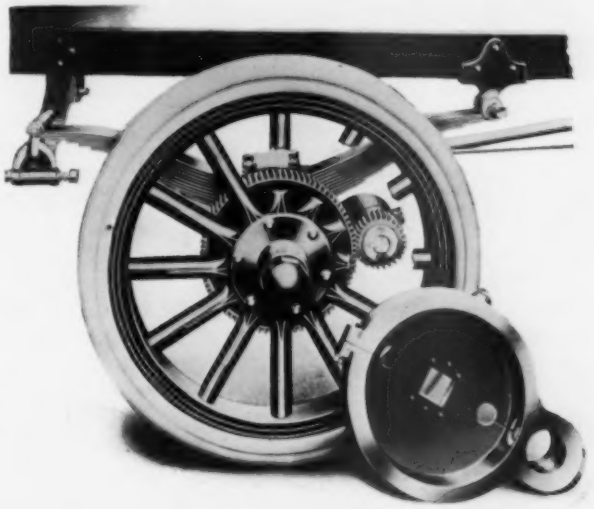
Sampson Loaded With Straw
This Sampson one and a half ton car is shown loaded with thirty-one hundred pounds of straw just taken out of a box car on the siding. Besides its economy, the car can be maneuvered more easily around the railroad yard than can a team of horses.

The Piggins Spur-Gear Driven Commercial Cars

AT THIS time, drives other than the usual chain and shaft, are accorded more than usual attention. Illustrative of this is the Piggins line of commercial cars, which are spur-gear driven, made in various sizes by the Piggins Motor Truck Company, of Racine, Wis.

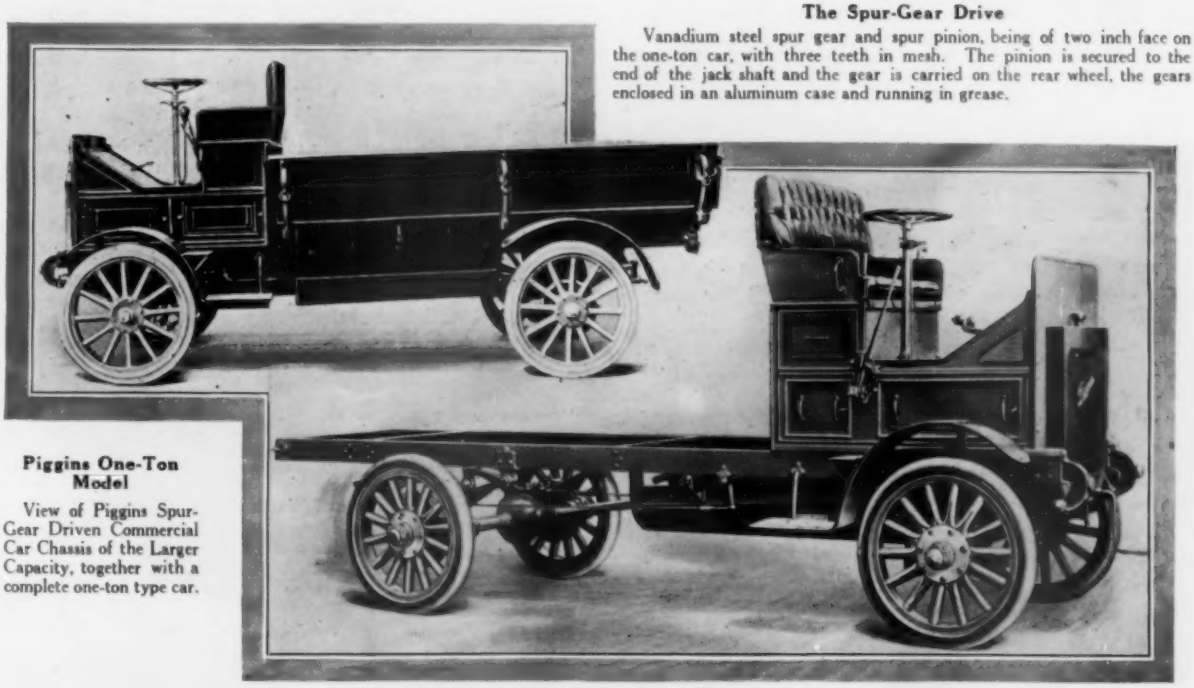
Supplementary Axle

The Piggins application may be regarded as a supplementary axle equipment, and from the illustrations it will be noticed that the car load is supported by a Sheldon dead axle. The supplementary axle follows the construction of the usual jack shaft, but instead of being located amidships is in proximity with the dead axle. The driving spur pinions, 2 in. face, mesh with the spur gears carried on the rear wheels. The meshing gears are fully enclosed and quietness and smoothness of action are salient claims of the construction. The spur pinions are secured to the jack shaft as would be an ordinary chain sprocket. Vanadium steel is the material used in the gears. The driving shafts are squared on the inner ends, with a bevel type differential containing four pinions. The lower spring support, jack shaft bracket, and brake supports, are made in one casting. The supplementary axle is permitted to oscillate in a Babbitt lined bearing. In all models of Piggins trucks Sheldon front and rear axles are used, also Sheldon springs, with front axles, center dropped and the steering yokes formed integral. Front springs are semi-elliptic, 40 in. long, of the rear platform



The Spur-Gear Drive

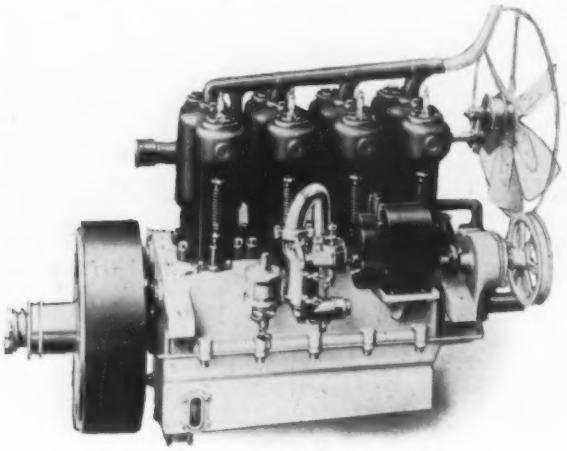
Vanadium steel spur gear and spur pinion, being of two inch face on the one-ton car, with three teeth in mesh. The pinion is secured to the end of the jack shaft and the gear is carried on the rear wheel, the gears enclosed in an aluminum case and running in grease.



Piggins One-Ton Model

View of Piggins Spur-Gear Driven Commercial Car Chassis of the Larger Capacity, together with a complete one-ton type car.

type, all leaves center ribbed to prevent shuffling. The rear springs are 44 in. long with 34 in. cross member, all spring eyes being bushed with bronze, while all spring brackets are cast steel. Wheel bearings are cup and cone ball type.



Novel Intake Manifold

Intake side of the one-ton motor, with carburetor attached to a goose-necked pipe secured to a crank case. The rectangular sections of the cylinders seen behind the valve springs are the cored intake passages leading to the combustion chambers.

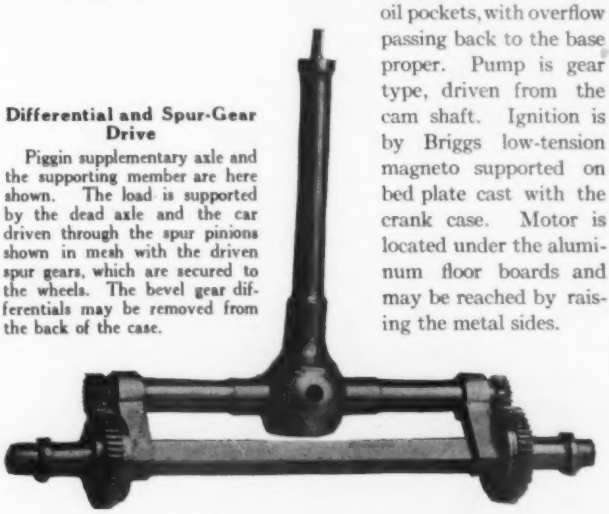
Steel Frame

Frame is channel steel and is inswept forward, being reinforced through cross members, hot riveted to place. Motor and transmissions are carried on a steel sub-frame which describes an angle, the rear of the frame being four inches lower than the front. The forward support is to a cast steel cross member of the main body, rear to two cast steel brackets secured to the center cross member. Wheels, wood, artillery type; are 36 in. diameter on the one-ton model. Tires are in keeping with the size of the car, front equipment single, rear dual though singles are recommended for country work.

There are two sets of brakes, in the rear wheels and on the rear of the transmission shaft, latter external contracting, former expanding. In the one-ton model the wheel brakes are 12½ x 2 in., transmission shaft brake 8 x 2 in.

Four-Cylinder Engine

The Piggins prime mover is interesting in that the usual intake manifolds for gas and water are dispensed with, these being cored in the crank case and cylinders. The carburetor flange is bolted to the case and the gas enters the port and passes to each cylinder through a rectangular port which registers with the cylinder. The cylinder passage is of the same conformation as the crank case outlet and no water is carried about it, the contention being that the cool, incoming gas will amply care for the cylinder wall at this point. The water intake on the opposite side cored in the crank case has round openings registering with round passages cored in the cylinders. Lubrication is by splash with pump circulation, base of the crank case having integral dams and oil pockets, with overflow passing back to the base proper. Pump is gear type, driven from the cam shaft. Ignition is by Briggs low-tension magneto supported on bed plate cast with the crank case. Motor is located under the aluminum floor boards and may be reached by raising the metal sides.



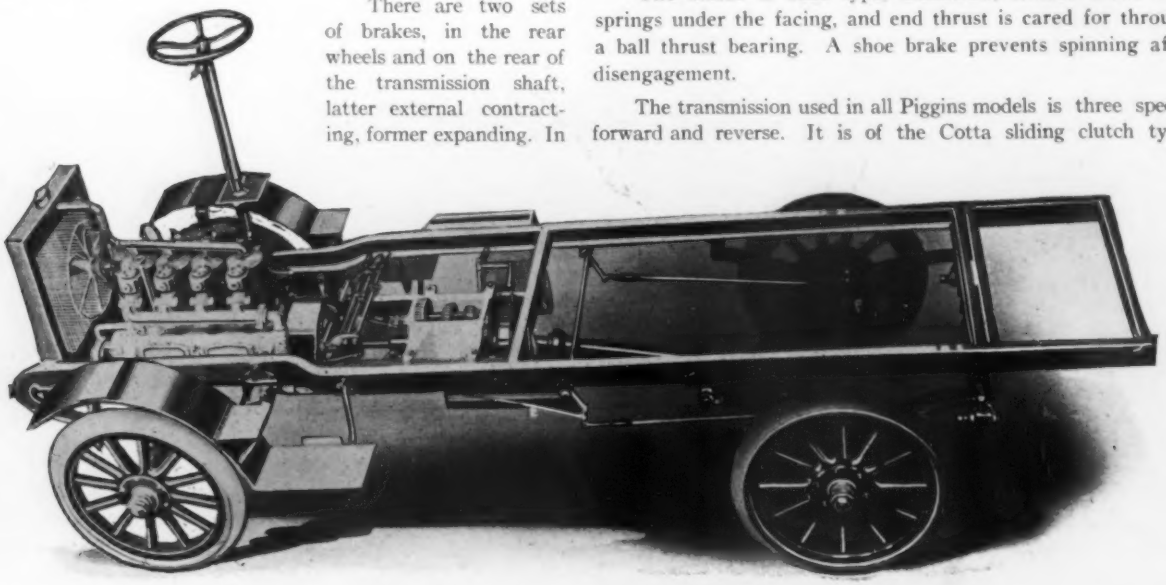
Differential and Spur-Gear Drive

Piggin supplementary axle and the supporting member are here shown. The load is supported by the dead axle and the car driven through the spur pinions shown in mesh with the driven spur gears, which are secured to the wheels. The bevel gear differentials may be removed from the back of the case.

Clutch and Transmission

The clutch is cone type, aluminum, leather faced with springs under the facing, and end thrust is cared for through a ball thrust bearing. A shoe brake prevents spinning after disengagement.

The transmission used in all Piggins models is three speeds forward and reverse. It is of the Cotta sliding clutch type,

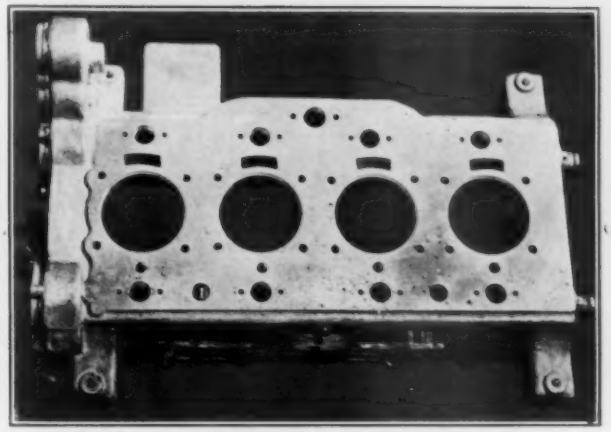


Exposed Mechanism of Spur-Gear Driven Car

Construction of the one-ton chassis is here shown. The two, three and five-ton models are along the same lines. Note low placed engine, showing exhaust manifold; the spur-gear drive mechanism can also be seen. This chassis, as shown, sells for $1650

Piggins Cylinder Castings

All Piggins engines are fitted with single cast cylinders, T-head type, valves in overhanging pockets. Water and gas intake pipes are shown. The rectangular section is the intake passage, the gas being drawn through the crank case and up through this passage.



Piggins Crank Case

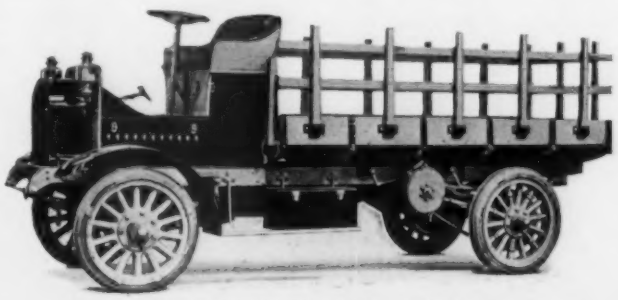
The center top opening is for the carburetor intake flange; the rectangular openings lead from the integral intake manifold and register with similar-shaped openings in the cylinders, through which the gas passes to the combustion chambers. The smaller round holes at the bottom of the case are the water passages; intake also cored in the crank case. This construction eliminates the usual water and gas manifolds.

mounted on ball bearings. The transmission is operated through usual side hand lever at the right, with gear box of aluminum, and cast with it are the four supporting lugs, anchorage being to the side rails of the sub-frame. The Piggins one-ton chassis is $1650. Other sizes are two, three and five tons capacity.

The Jeffery One and a Half Ton Truck

The Thomas B. Jeffery Company, of Kenosha, Wis., which has for many years manufactured the Rambler motor cars, is now making extensive tests of its new 1½ ton truck, in order to determine its efficiency for wide general use in the service truck field. This truck has a carrying capacity of 3000 lbs., of which 60 per cent. is carried on the rear wheels.

The motor, which is located under the footboards and seat, is of the four-cylinder, vertical, water-cooled type and is rated at 38 h. p. Ignition is by means of a Bosch high-tension magneto, and lubrication by a combination of force feed and crank-case splash.



The Jeffery One and a Half Ton Truck

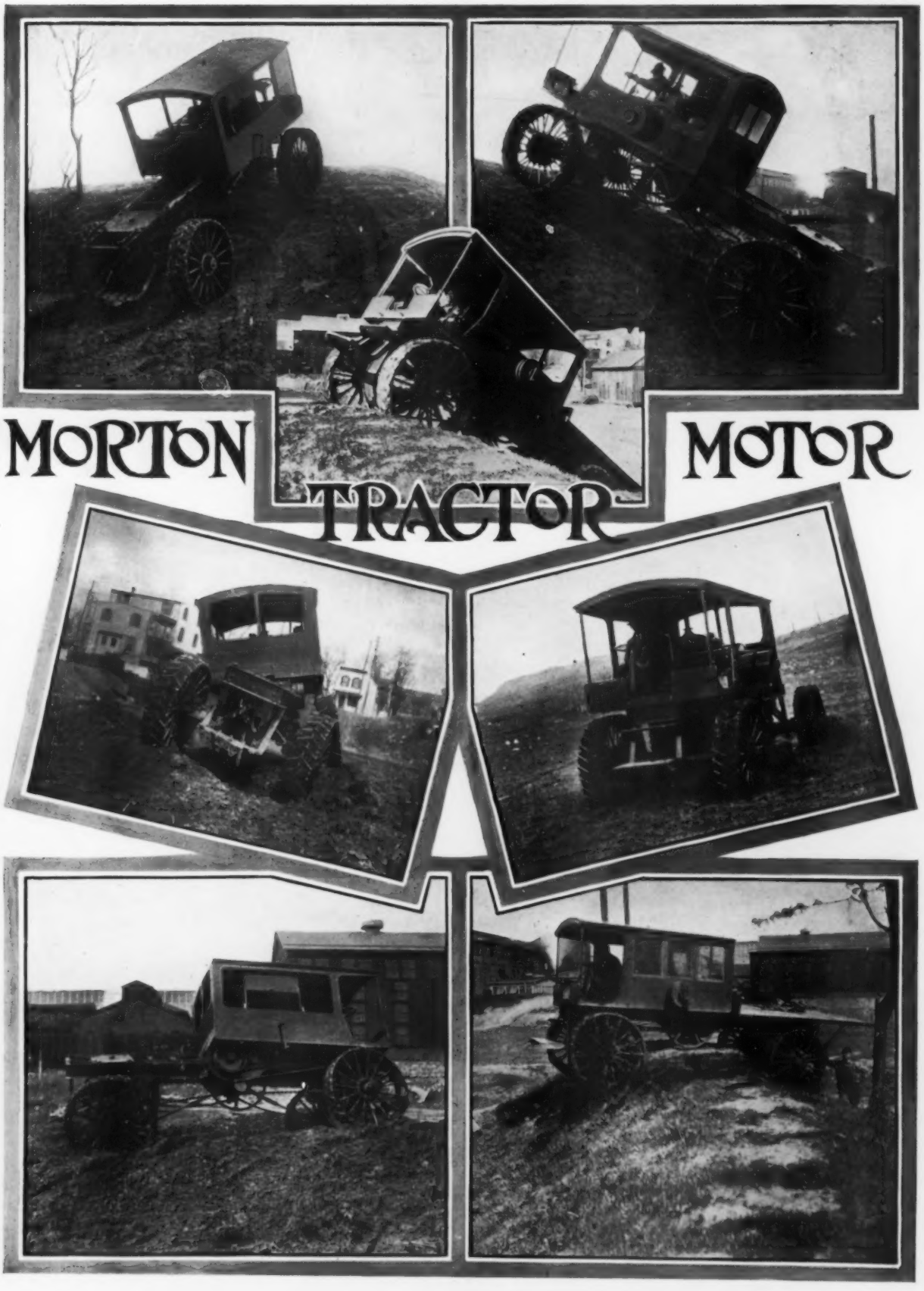
Transmission of the power is through a system, which includes a three-speed change gear, jack shaft and final drive by means of two side chains to the rear wheels. The maximum speeds on the first, second and third gears are 3½, 7 and 15 miles per hour, respectively. The control of speed changes is by means of a lever projecting through the center of the heel board of the driver's seat, and the steering wheel is placed on the left side.

Pressed steel of channel form is used for the frame; the total overall length of which is 185 in., with a length of 120 in. back of the driver's seat, and available for carrying the body, which may be had of any desired type or style. The stock body, however, is 60 in. wide and the same length as the frame back of the seat, that is 120 in., and is of platform variety with low side boards carrying pockets into which the vertical posts of the side racks are fitted. The body is heavily ironed, and the height of the platform, when loaded, is 34 in. from the ground. All the springs are of the semi-elliptic type, and the wheel base is 120 in.

Both front and rear wheels are 34 in. in diameter; the front wheels are shod with 4 in. solid single tires, and the rear wheels with 3 in. solid dual tires.

The breaking surface is large for a light truck, there being two sets of brakes used. The service brake, which is operated by a pedal, acts on the two drums, each 13½ in. in diameter and 2¼ in. wide, while the emergency brake, which has the customary hand control, has two drums each 15¼ in. in diameter and 3 in. wide, making a total braking surface of about 478 sq. in. The service brake drums are located on the counter shaft and the emergency brake drums on the rear wheels.

A gasoline supply tank is placed under the seat, and has a capacity of 20 gal., and the lubricating oil supply is 1 gal. The chassis is furnished with oil side and tail lights, and the usual set of tools, which are carried in a box secured to the frame on the left side of the car, at the price of $2650. Body prices are furnished upon application.


MORTON
TRACTOR
MOTOR

Some Morton Motor Tractor Company Products

THE MORTON TRUCK

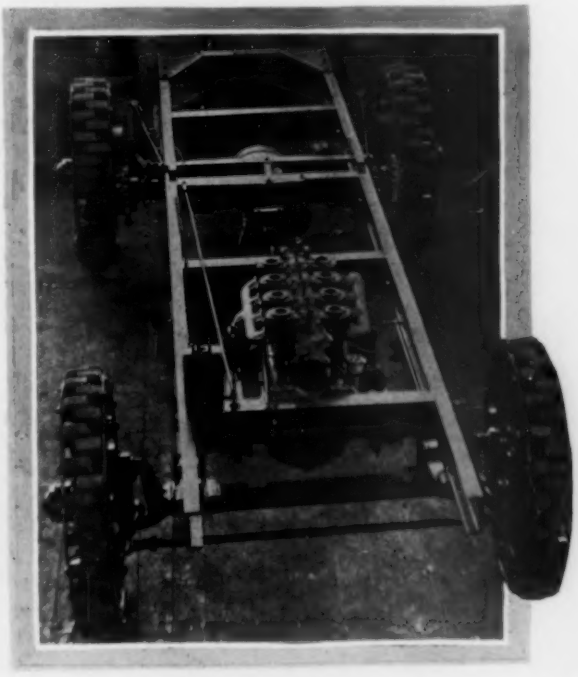
PROBABLY the most individual feature of the Morton truck, which is manufactured by the Morton Tractor Company, 19th and Derry Streets, Harrisburg, Pa., is the location of the motor. To see a two-cylinder motor, of the opposed cylinder type, located under the seat is not an unusual thing, but when a four-cylinder motor, with cylinders cast singly, is found located in such a position it might be worth noticing.

The Motor

This truck is of four ton capacity with a 32.4 h. p., S. A. E. rating engine, which is located just back of the front axle and almost having its crank case as low. The motor is a 4 cylinder 4 cycle one, cast singly with water jackets integral, bolted together, intended to give an enbloc steadiness. It has a bore of 4 1-2 in. and a stroke of 4¾ in. and is water-cooled by a honeycomb radiator and pump. The motor is mounted on a sub-frame, thus making it low enough to allow the driver's seat to be set directly on the chassis frame.

Ignition and Lubrication

A G. and A. carburetor is used with a short intake pipe. A Bosch magneto is used for ignition purposes with the dual equipment, having two sets of spark plugs, with a Columbia storage battery and also 6 dry cells used in conjunction with the Bosch system. Lubrication is of the force feed and splash system type, assuring the thorough lubrication of all the parts that necessitate a constant oil bath.

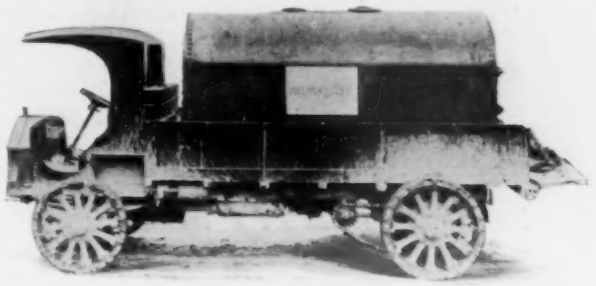


The Morton Chassis

This illustration shows the engine suspended from the frame by a sub-frame, with its single-cast cylinders bolted together. The wheels, of peculiar construction, have a solid rubber tread, mounted on Kelly rims.

Transmission and Brakes

A leather faced cone clutch is employed with a shaft to the transmission, which is of the selected type with three speeds forward, direct on third, and one reverse, mounted in the middle on the jackshaft; from here side chain drive



A Morton Truck With Load

This shows the truck, with a four-ton load, encountering some muddy roads. The location of the gasoline tank can here be seen, also that of the Presto tank on the side of the frame, just below the forward part of the body.

to rear wheels. There are two sets of brakes, a contracting and an expanding set, Raybestos faced and applied on rear wheels. The tires are solid, and of a dual staggard tread type, the front being 35 x 5 in. and the rear 40 x 4 in., mounted on Kelly rims.

Springs and Control

Both the front and rear springs are semi-elliptic, on which is mounted the channel steel frame, constructed so as to give a wheel base of 130 in. The steering wheel and control levers are at the right, with the spark and throttle levers just below the steering wheel. The gasoline tank is located just in back of the driver's seat and has a capacity of 30 gallons. The motor cranks by hand. This truck comes equipped with gas tank, gas and oil lamps and cab with curtains. The special features of this truck are its short wheel base, the large pay-lead capacity, the high wheels and the accessibility. "Model B," as this truck is designated, sells for $3000.

THE MORTON TRACTOR

Here we have a most novel and unique construction of motor tractor which embodies the ideas of the inventor to make this machine serviceable for marshy, sandy and hilly country, such as seen encountered in the accompanying illustrations. The driver's seat is located in an enclosed cab, which also serves to keep dust and dirt in all weather conditions from the engine. The engine thus located, gives also easy access to all parts. The driver at this advantageous location has command of the road in front, steers with wheel on right side with throttle under wheel, two foot brakes, service and emergency, and three speeds.

Engine and Transmission

The engine is rated at draw bar at 25 h. p. At third speed, 11 m. p. h. is maintained at 1000 r. p. m., at second speed 5 1-2 m. p. h. at 1000 r. p. m. The engine is of the

four cylinder, four cycle, vertical type with a 5 1-4 in. bore and 6 in. stroke. The transmission is of the Morton heavy selected type, three speeds forward and one reverse. All gears and sheave wheels are encased and run in oil, all gears being of cut steel. On the outside of the cab there is located a driving pulley for belt transmission, which for stationary purposes can be belted so as to transmit power to threshers and other farm machinery.

Four-Wheel Drive and Steering

At the rear of the tractor there is a draw-head which is of use when hauling heavy loads or plows. The body of this machine is swiveled. On the front section the cab with driver's seat and engine is located, while the back section is nothing more than a platform. This idea of construction makes the load parallel with the body at all times. Power is applied to both front and rear axles by means of a heavy chain, the housings being of open hearth steel. These axles are of the semi-floating type and are made of nickel steel. Steering is by both front and rear wheels, this being accomplished by a heavy chain which runs transversely from front to rear axle and up through the center of the chassis to engage with the steering mechanism proper. The wheels, which are of iron, are 50 in. in diameter with a 12 in. face, skeleton suspension type. Being four wheel drive, the tractor is especially adapted to the aforesaid road or land conditions.

The bearings are adjustable roller type, and so arranged as to make them dust proof. The idler pulleys always guide the chain drive to sheave pulleys in a true and perfect alignment. The driving chain is a patent Martin adjustable link chain, having round and square links, the square links being adjustable with nuts and washers to take up all lost motion due to wear. This tractor can be equipped with wheels for use in country or city. The traction type wheels are of iron with self-cleaning, open tread segments, while those used for city purposes are of the artillery type with wood tread, self cleaning. The wheel base is standard 144 in. with a tread of 60 in. This tractor as just described, has a total weight of about 8000 lbs.

Crown Fifteen Hundred Pound and One-Ton Trucks

Crown commercial cars are manufactured by the Crown Commercial Car Company, at North Milwaukee, Wis. This concern began business a year ago and efforts are devoted to two sizes of chassis, 1500 and 2000 lbs., the latter featured in this text.

In both chasses, constructive features are identical. The cars are built along standard lines, and he who looks for something radical will not find it. Standard has been given preference, rather than something radical and untried.

Four-Cylinder Motor

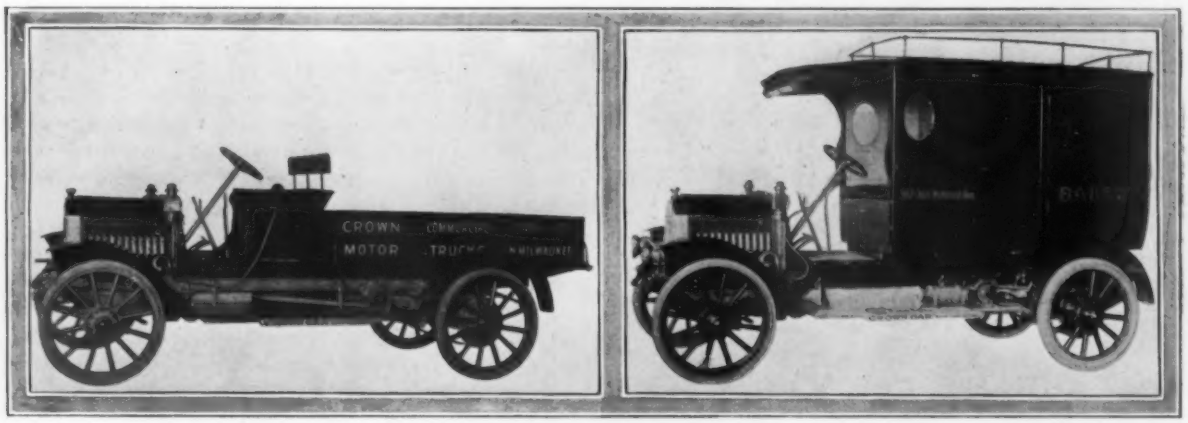
A four cylinder, Oswald T head motor, 3¾ x 4½ in. is used, the cylinders cast separate, but anchored together with 6 tie rods, thus forming a single block 18 in. over all. The motor, rated at 26 h. p., represents no radical deviations from standard, and therefore requires no extensive description here, although the cylinders, when assembled, form a very compact block. A five-bearing crank shaft is used, this formed with an integral web for the fly wheel. All crank bearings are 1⅜ in. diameter. Valves, nickel steel, are 1¾ in. diameter. Lifters are fitted with 1 in. rolls, ⅜ in. face, ⅜ in. hardened pins. Guides are bronze. The built up cam shafts have three bronze bearings.

Disc Clutch and Individual Jaw Clutch Transmission

Clutch is multiple disc type. 19 steel plates with special steel shaft are enclosed in the fly wheel housing and operate in oil. Thrust is cared for through a ball thrust bearing.

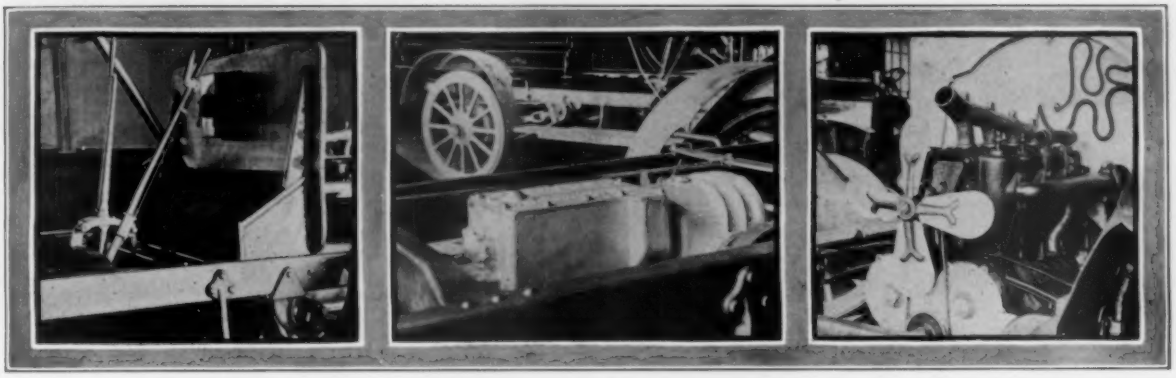
A Cotta individual jaw clutch transmission is used, this fitted with ball bearings, all gears constantly in mesh, having three speeds forward and one reverse.

The bevel gear differential is contained in the rear of the transmission housing in a separate compartment, with gears having 1 in. face. The Cotta transmission was recently fully described in the May JOURNAL, Page 32. Shaft between clutch and transmission is 1¼ in. diameter.



Crown Body Types

Two Crown one-ton chasses fitted with bodies, one an open delivery body the other a special body intended for bakers' use, this having sliding side doors. Wheels are wood, 36 in. diameter fitted with three inch solid rubber tires. Loading space back of the seat is 72 to 86 inches according to the requirements. The running board is anchored to pressed-steel hangers.



Control Mechanism, Transmission and Motor

Three views showing location of the motor, which is housed under a forward bonnet. The four cylinders are cast separate but are joined together by means of six tie rods, thus making the cylinder block very compact. Support is by two steel cross arms from which the motor is suspended. Control levers are located at the center so that operation is by right hand. The steering post is carried at the left and is comfortably inclined for the driver. The Crown Transmission is a three speed and reverse, individual jaw type fitted with annular ball bearings and is located amidships supported at three points.

Side Chain Drive, Sheldon Axles and Artillery Wood Wheels

Final drive is through side roller chains, 1 in. pitch and ⅝ in. wide, with tension adjustable through a screw and nut device incorporated in the side radius rods which reach from the jack shaft outboard brackets to the rear axle. The jack shaft outboard bearings are Hyatt rollers.

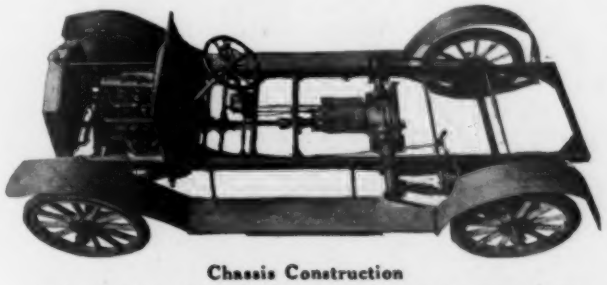
Sheldon axles are used, these being ball bearing, front being 1½ in. square, rear 1 11-16 in. spindles with 1¾ in. square section, with front axle dropped 2½ in.

Artillery wood wheels are used, 36 in. front and rear, with 3 in. solid rubber tires. Tread is 56½ in., and wheel base is 116 in.

Pressed-Steel Frame and Brakes

Frame is pressed steel, 154 in. long, 34 in. wide, 4 in. channel 3-16 in. stock, gusset plates at the rear. Reinforcement is through four pressed steel cross members. The engine is mounted by means of two steel cross arms, retention to the cross members being through heavy steel bolts at four points. The three speed transmission is three-point supported, and is disposed amidships.

Of brakes there are two sets, on the rear wheel drums and on the jackshaft. The jackshaft brakes, 8 x 1½ in., are foot operated. The external rear wheel members, operated by the hand lever, are 10 x 1¾ in. The pull rods are steel, ⅜ in. diameter and fitted with adjustable ends. All brakes are equalized, with double acting jack shaft brakes.



Chassis Construction

This view of the chassis affords a very good idea of the crown construction: the motor located forward, the multiple-disc clutch housed in the flywheel, drive from clutch to individual jaw transmission being a 1¼ in. shaft fitted with universal joints. The transmission is supported at three points and the jack shafts are fitted with two brakes. Final drive is through side roller chains and the axles are Sheldon make. The full-elliptic rear springs are suspended from rather than resting upon the rear axle.

Springs and Steering

Front springs are semi-elliptic, 40 x 2 x 8 in., and follow the usual construction. The rear springs are full elliptic, 38 x 2 x 8 in. A feature of the rear members is that they are suspended from instead of resting on the axle. The makers contend that this disposition makes far easier riding and longer car life.

Steering is through a worm and sector, with 16 in. wheel and 1⅝ in. post. The steering connections are 13-16 in. diameter and the drag link is fitted with ball and socket joints.

Control

Control is standard. The spark and throttle levers are above the steering wheel. Steering is from the left and the control levers are placed in the center so that the driver may work them with the right hand. Brakes are hand and foot set as noted above.

A high tension system of ignition is employed with magneto as prime current source with battery and coil for starting. Ignition is controlled from the dash and steering wheel. The carburetor, Rayfield type, is controlled from the steering wheel and also by means of a dash lever.

Lubrication being self-contained splash system with subbase oiler in the crank case, this feature requires no attention, save on occasion. Circulation of oil is induced by pump. Cooling is by thermo syphon system. A belt-driven fan mounted back of the cooler of conventional design, draws the air through the radiator and over the cylinders. With the usual water pump eliminated the care is somewhat simplified. Water intake and outlets are of liberal dimensions. Gasoline capacity is 12 gal., with gravity feed.

In the 1911 reliability truck contest couducted by the Chicago Motor Club the Crown car was awarded a silver trophy, being the only one in its class on solid tires with a perfect road score and passing the technical examination.

Price of the 2000 lb. Crown chassis is $1350 f. o. b. North Milwaukee. Bodies are extra and any type may be fitted as ordered, and the loading space back of the seat is from 72 to 86 in., according to the requirements.

The Hindley Worm-Gear Drive

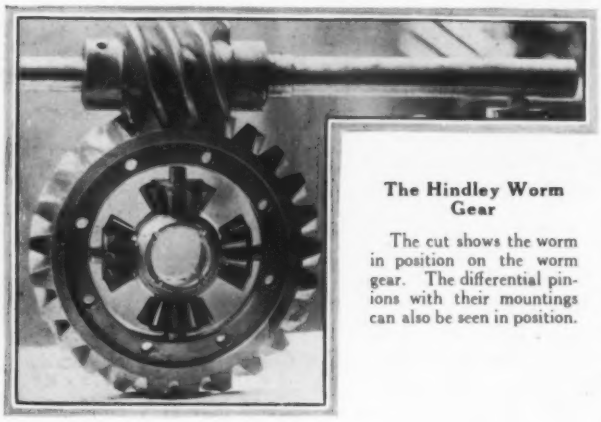
BY MINOR HARVEY

WORM Gears are one of our oldest methods of transmitting power. The early gears were made with cast teeth and cast threads and finished by hand.

The first application of worm-gear drive to self-propelling vehicles was made to a trolley car, in the early Seventies, on the street car lines of Philadelphia.

The first application of such gears, as far as the writer knows, to a so-called automobile were gears made in Philadelphia and shipped to England where they were installed in a car by Hugh Moffat, of Cedare Bowrenbrook Road, Birmingham, C. B., England. The next installation was applied to a small runabout built by the Autocar Company, at Ardmore, Pa.

Following these installations the gears were used by the Babcock Electric Carriage Company in their five passenger electric brougham. The possibilities of this gear drive were then taken up by the Commercial Truck Company of America, who are already well and favorably known for their electric cars of 500, 1000 and 2000 lbs. carrying capacity. After a number of careful tests of various size gears they determined the gears suitable for each of the above cars, one car of which has a record of over 35,000 miles and the gears are still in perfect condition.

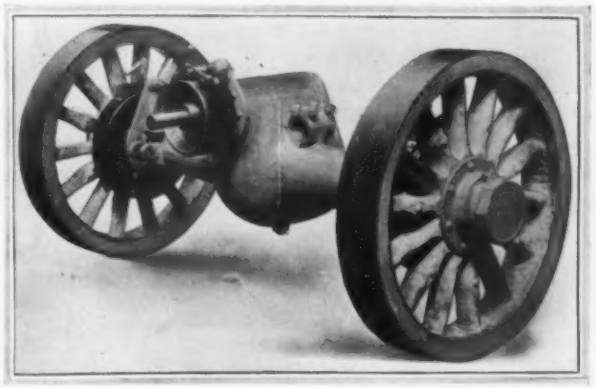


The Hindley Worm Gear

The cut shows the worm in position on the worm gear. The differential pinions with their mountings can also be seen in position.

The Mitchell Motor Car Company, Racine, Wis., F. A. Bates, Engineer, was the first to bring out a 1½ ton truck with a worm gear axle; this was in 1906. Following this, Mr. Morse, of Torrington, Conn., was the first to bring out a 5 ton truck with a worm gear drive, of which he built three in the early part of 1907.

The most essential feature of a truck is probably to have gears of proper size, pitch and ratio, taking into consideration weight of truck, mileage per hour, its carrying capacity, also size of motor to be used.



Complete Rear Axle Assembly, showing service brake as applied to driving shaft

For this purpose the Hindley Worm-Gear Works, S. W. Corner Twelfth and Sansom Streets, Philadelphia, has selected gears of the following dimensions and material, which it is said, cover the requirements of all standard trucks as now built.

Worm wheel—12 in. diameter, 25 teeth, 1.6 in. pitch, of Cramp's Special Gear Metal, depth of tooth 1¼ in. Worm—Special alloyed steel, 4⅛ in. diameter, 4 threads, with lead 4.89.

Bearings, Size and Construction

The second item of importance in making a worm-gear axle, is to have the gears properly mounted on bearings of sufficient size that the gear may be held rigidly in place. The annular bearings in the worm shaft are 1⅝ in. bore, 4 in. outside diameter, 1 in. wide with ¾ in. balls. The thrust bearings are 1⅜ in. bore, 3⅞ in. diameter, with ¾ in. balls and a special heavy retaining ring for the said balls. The worm wheel itself is carried on annular ball bearings 2½ in. bore, 5½ in. diameter, 1.3 in. wide with ⅞ in. balls. These bearings have been carefully selected not only to carry ra-

Ball, Roller and Thrust Bearings of the Hindley Worm Gear Are Here Shown, Together With the Differential Gears, Pinions and Mountings. Note single construction of ball thrust bearing and method of retaining balls.

dial load on worm wheel, but are of sufficient size to carry side thrust of worm wheel. From the first glance at these bearings, the criticism which presents itself is due to their excess size compared with those used on the ordinary jack shaft of the rear axle. Considering that a single set of gears must withstand engine torque and road shocks, it is necessary to have bearings of ample size to withstand such stress without undue load.

Differential Construction

The application of the worm gear drive to a truck brings into consideration a differential which must be of such size and carrying capacity as to withstand not only torque from driving truck, but also the unevenness of the road, which brings the differential into play at all time. Their careful thought has been given to this particular point, and their differential is of an especially heavy design, casing of which is crucible steel casting with heavy pockets for supporting hubs of gears which take the driving shaft, the pinions being carried on pins 1. in. in diameter, hardened and ground. The differential gears are of the following dimensions:

Large gear—35 carbon 3½ per cent. nickel steel, Midvale material, hardened and ground, 5¾ in. in diameter. 1 1-16 in. face, 4 in. diametrical pitch, and the detail of this differential is carefully provided with oil grooves and oil holes which insures continuous lubrication.

Casing and Mountings

The axle casing is of crucible steel casting; bearings for the differential are cast integral with the casing; bearings for the worm shaft are a separate unit with bearings and

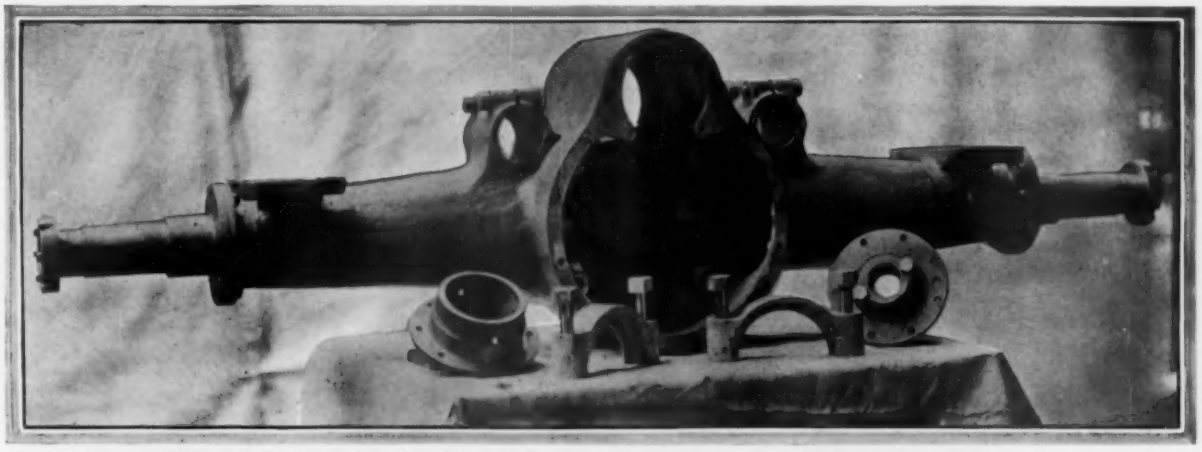
Brake Drums, Axles and Hub Caps of the Hindley Worm-Gear Drive Construction, showing protecting lips on drums by which they are bolted to the spokes of the rear wheels.

bon 3½ per cent. nickel steel, semi-drop forging, carefully heat treated—diameter on large end is 3 3-16 in., having an average thickness of metal of ½ in., insuring the wheel supports of the strongest possible construction and the least possible weight. These axle ends have a projection inward from the flange of the axle casing extending to and reinforcing the support of the spring seat where direct load is applied.

Driving Shafts, Hub Castings, Brake Drums

Driving shafts or floating axles are 35 carbon 3½ per cent. nickel steel, Midvale stock, 1¾ in. in diameter, with four splines for the differential and for the hub end which is enlarged to 5½ in. in diameter integral with shafts and has four slots for driving on hub castings.

The hub castings are of crucible steel casting. Brake drum is 14 in. in diameter with projecting ears beyond the



Rear Axle and Differential Housing With Differential and Worm Gears Removed, Showing Axle and Differential Retaining Straps

mounted in their particular case and in turn attached to casing itself. This insures ample protection of bearings, also provides them with a substantial mounting. This particular item is not taken from the automobile accepted practice, but from years of experience in the elevator business in which the ball bearings form an important item, the duty of which is far heavier than any truck service, as the function of an elevator is continuous in starting and stopping, and the mounting of ball bearings in a protecting cage has been found to be valuable beyond imagination.

The spring seats and distance rods are also integral with axle casing. The bearing ends or wheel supports are of separate cases pressed into the steel casing and riveted fast becoming a unit with case itself. These ends are of 35 carbrake drum for bolting to wheel. The hubs are carried on Standard Roller Bearing Company's taper bearings, 2 11-16 in. bore, 4¾ in. outside diameter, 2 1-16 in. wide, rollers ⅝ in. in diameter. The bearings are protected from dirt and dust by special dusting provided with three separate felt washers. The hub cap is of heavy type crucible steel casting with slip joint and held in place by a single bolt. This axle is provided with two sets of brakes. The service brake is directly on the worm shaft which gives ample braking capacity under all conditions without undue foot effort, is self contained part and is carried forward with either cable or rod. The emergency brake is of a contracting type, 14 in. in diameter and 3½ in. wide. This driving gear is designed for trucks of either 2½ or 3-ton capacity.

HOW TO BREAK IN A TRUCK DRIVER

THE "breaking in" of a new driver on a motor truck is a very important feature. On this man depends to a great extent the success of the truck. Through him it can be run one year or five years, granting of course, that the machine is a first class one.

It might be said here, for the benefit of buyers of motor trucks, that when a heavy commercial car is offered at a low figure, beware. To get the goods one must pay the price and in the long run it will pay to do it. So if you have a cheap, big truck don't expect your driver to keep it running like a high priced one. He cannot do it.

Give the Teamster a Chance

Most motor truck buyers are at present using horses and disposing of them as the trucks are bought. The first question one thinks of, is whether to put the teamster on the truck or not. If the man has served you faithfully, and has a fair amount of intelligence, by all means give him a trial, and nine out of ten times he will prove a great success. He has the great advantage of knowing nothing about trucks, but is willing to be taught. This last phase is very important. This kind of a man will follow instructions more carefully than will the hired chauffeur, and will take more pride in his truck. A chauffeur cannot be taught anything, for he feels experienced, and in few cases is.

The Lessons

To break in a teamster on a truck, take him to the outer edge of the city, and as soon as you get away from the traffic let him drive a while, to get accustomed to the manipulating of the wheel. Then stop and carefully explain the clutch action, and why there are several gear shifts, using plain, simple words. Among the first things is to impress strongly on his mind how to stop quickly. Then the man sits behind the wheel and tries starting and stopping. Do this at least a dozen times. By night he has become pretty familiar with the actual driving. The next day show him how to crank the engine. See that the oil in the crank case is up to level, turn up all grease cups, look in the radiator and gasoline tank. Then get the instruction book and read over every word aloud, explaining each diagram or picture. Examine the tool box and show him what use each tool has. The rest of the day he drives, but now, of course, the truck is in service.

The third day again read the instruction book, and also each day that an instructor is along. Do this many times. The third morning the man turns up the grease cups, giving each one a complete turn and repeats to the instructor the principal instruction of the first two days.

The fourth day is a repetition of the third with a few new points added, such as cleaning the spark plugs and carburetor, washing out the clutch, taking up chains, detecting explosion misses, tightening steering post, flushing out the water system, taking up brakes, tightening all nuts, spring clips, etc. Of course care must be taken not to crowd the man too fast, but at the same time teach him all you possibly can that may be useful to him.

The fifth day everything previously studied is gone over; in this way, and only this way, can so much be impressed on the man's mind. If he is not very quick at grasping things, they must be drilled in.

This day we may take off a wheel and inspect its bearings, remove a chain, look in the transmission and differential. Then explain their actions and their proper oil levels.

The sixth day is again a review of the other five. He asks for information on any point not previously covered, or one he may not have understood.

The Last Day

On the seventh and last day have him change oil throughout the car and refill, to make sure he understands the amounts and kinds. He repacks all grease cups, tight-

High-Wheeler Does Work of Two Teams

An International Harvester two-cylinder, air-cooled car does the work of two horse rigs in the service of the American Hardware Company, a young concern on the outskirts of the city of Detroit. The base is four miles from the center of the city. Deliveries are made everywhere in the car, the average per day is thirty to thirty-five miles and approximately fifty miles on Saturdays. The car has been in use but a short time and cost of operation is seventy-five cents a day for oil and gasoline. The owners state that the vehicle was especially effective in the spring muds where smaller wheels were at a disadvantage. As much of the deliveries are in the country the high wheels are favored. To do the same work with horses would be prohibitive when cost is considered, for it would require several to cover as much ground, to say nothing of making the time. The owners state they could not and would not do without the vehicle. It is their first car and they are very enthusiastic about it.

The COMMERCIAL CAR JOURNAL editors will gladly supply the readers with special information on any of the cars, parts or accessories described in our columns. Do not hesitate to write us.

ens and greases chains, and in fact, actually performs every operation touched on during the week. Then test him by slyly disconnecting a spark plug terminal and let him detect and find the miss, or change the carburetor adjustment to see if he will notice it. In fact, this day he gives it the same roundhouse attention that he should give it every 1000 miles. This roundhouse work is absolutely necessary; just as the locomotive, running on rails, receives it after every trip, so must the truck receive a certain amount every day, and a good looking over every 1000 miles.

We now have the beginning of a good driver who thoroughly understands the care of the truck. It is now up to the owner to see that he does it. Of course he will not have everything clearly in mind, but when troubles come, he will recall these things, and this drill will then be very useful to him. It is most important to impress on him the value of a little work every day, a good job every two weeks or 1000 miles. To the owner this means reduced expenses and two years added to the life of the truck. But at the same time the owner must not expect a man to do all of this on fifteen dollars a week. The writer strongly recommends raising him to twenty after the first month; it will usually pay to do it.

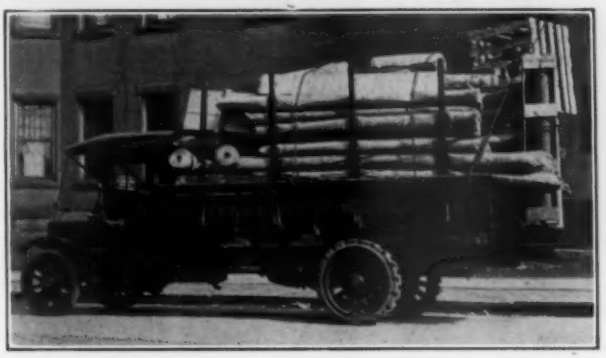
STERLING AND WELCH COMPANY INCREASE MOTOR DELIVERY DEPARTMENT

Ten gasoline cars are used by the Sterling & Welch Company, Cleveland, O., in delivery service, seven of which are Whites, four of these 3000 lb. capacity, three 1500 lbs.; a four ton Peerless herewith shown was recently added. A three ton Packard has been used for some time and a two ton car of the same make has recently been purchased. The largest cars are used for heavier work, while the two ton Packard and the White 3000 lb. vehicles are used for furniture delivery.

Average daily work of the smaller vehicles is 50 miles and all the longer hauls are made with the cars, the horses still in commission being utilized for the shorter city work. Five of the ten cars were used all last winter and sixteen horses. Aside from the heavier vehicles tire equipment is pneumatic, while on the four ton Peerless, Kelley block tires are used at the rear.

Twenty Per Cent Depreciation

It is estimated that 20 per cent. will cover depreciation and such an amount is charged off. In 1911 repairs on four of the White cars cost $280, the biggest item of cost being tire equipment. The drivers are men who have formerly



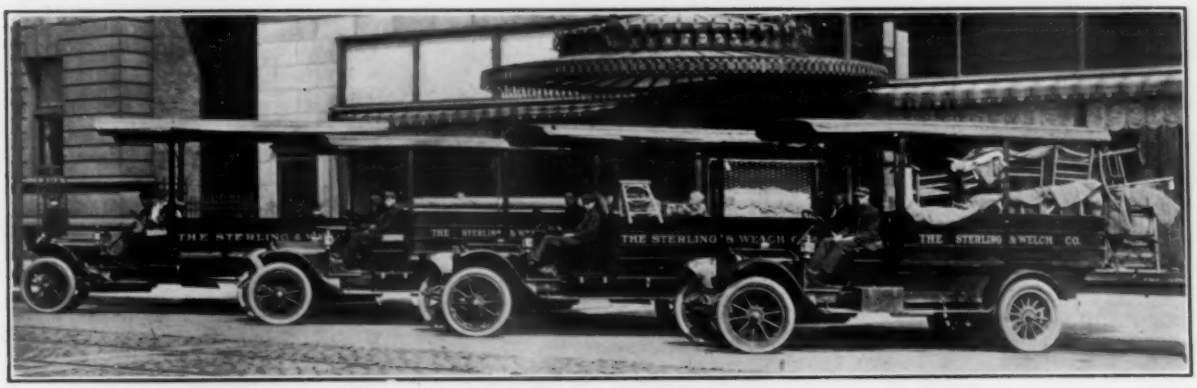
Four-Ton Peerless Truck Used in Sterling & Welch Company Service; showing the sort of load carried. This car is the latest addition

worked as teamsters and their work is said to be very satisfactory. The trucks are never overloaded and are always kept up to condition and washed every night.

The first car was purchased two years ago last December. The manager of the fleet was somewhat reticent regarding cost of operation, although he did state that there was not $100 difference in the cost of horse and car service for a given period. The cars are loaded at the back of the store and there is ample room for maneuvreing the fleet.

BRUSH DELIVERY WAGON DOES GOOD WORK

J. A. Rohner, wholesale dealer in wooden ware and paper at Akron, O., has for the past three years used a Brush delivery wagon and states that until a poor man had been put in charge of it his expenses were for gasoline and oil only. The first year the car was fitted with pneumatics, Motz cushion now being used. Mr. Rohner stated that he has at times carried as high as 930 lbs. in the little vehicle. He was so well pleased with it, he said, that he made a special trip to the makers at Detroit and was much disappointed that



Part of the Sterling and Welch White Truck Outfit; showing each car equipped with pneumatic tires. Each car carries a crew of two men and has a carrying capacity of three thousand pounds

they did not make a 1000 lb. Brush. In the past three years it has, he says, done the work of two horse rigs, the present set of tires being the second in service. "There was not a dollar of expense for the first two years of running," said Mr. Rohner, "after that when a poor man was hired to drive it I had to pay about $40 for repairs." The car has never been stalled and has never been pulled in, the owner stated.

Brush Delivery Wagon

Does good service in the wholesale wooden ware and paper business. This little car has run for two years with practically no repair expense whatsoever. It is a 500 lb. wagon and has carried as high as 930 lbs. without any harm.

This service is noteworthy as it emphasizes the adaptability of the small car which is of interest to those who contemplate purchase of light rigs.

CHASE AND GRABOWSKY TRUCKS IN SERVICE OF MAY COMPANY

According to J. B. Long, manager of the delivery department of the May Company, a large dry goods house and department store in Cleveland, a saving of "two" cents is effected on each bundle delivered. There are seven cars in service, two of which are 1-ton Chase two cycle trucks; two are 1500 lb. cars of the same make, used for regular routes, and the remaining three are 1½-ton Grabowsky trucks, which are utilized for furniture delivery and as feeders for the sub-station seven miles out. Service is here guaranteed and the builders of both types of cars are under bond to live up to their contract.

Under this service agreement the Chase cars are maintained at the Chase garage, the Grabowsky vehicles at that garage. This relieves the company of more or less fuss and cuts down the operating expense.

Sub-Station and Prompt Delivery

The sub-station is situated seven miles from the store. Bundles for the outlying districts are conveyed here by the cars and then distributed with horse teams. "A delivery system," says Manager Long, "can make or break a store. There is no question about that. A package neatly wrapped and promptly delivered is a store's best advertisement.

"It would require seventeen horses to displace the four Chase cars," said Manager Long. "One of the Grabowsky trucks works all night as well as during the day. There is no question but that you can give quicker service with cars than horses and the quicker the service the more business you can do." It has been the experience here that where one car had more than it could do and the work was divided with another truck the business soon became too much for both, therefore indicating a healthy growth. Prompt delivery will doubtless account for this.

Service Meter Used—Suburban Delivery

There is used on each of the May cars a service tell tale, which indicates stops and runs. That this sort of an arrangement is the best check on a driver, is claimed by Manager Long.

For suburban delivery, that is in Bedford and other towns along the road to Akron, co-operation with an expressman who also uses a Chase truck has been found worth while. The farmer who purchases a bundle now has it delivered at his house. The expressman makes this trip of 22 miles twice a day and has built up a good business.

Condition of Cars and Depreciation

On turning in his car at night a driver reports condition of the vehicle on a blank which he carries with him. His notations are made in duplicate, the owners use one, the garage men the other.

Depreciation is estimated at 33 per cent. and in three years the cars will have more than paid for themselves, which is regarded as true of all cars in service. That the cars travel much is evident from the fact that the Chases cover 40 to 70 miles daily, and overloading is not indulged in.

Chase Trucks for Delivery

A few of the May Company auto trucks, of which there are seven, showing the loads carried. By this truck system the company claims a saving of two cents on every package together with a more prompt delivery. Every one of these cars is equipped with a service meter as a check on the driver

The Mora Light Delivery Car

THE Mora Power Wagon Company, 5320 St. Clair Avenue, Cleveland, Ohio, features for 1912 one model of light delivery car rated at 1500 lbs. carrying capacity, bodies being either stake or open express type as standard. Tires are solid or pneumatic and the construction is such that the latter may be successfully used in such services where speed is requisite.

A Mora light delivery car not long ago was driven from Cleveland to the New England states, down the shore and through Pennsylvania and back to Cleveland, and on this trip there was abundant opportunity for Designer Birdsall to prove his construction on the level and hilly roads, through mud and sand. The results of the test were most satisfactory, it is asserted.

Opposed Motor Under Hood

The location of the engine in a light delivery car has much to do with the business-like appearance of the car, and this feature, while not necessarily a predominant one, must be considered. For the prime mover here Designer Birdsall has utilized a "square" motor, located under a forward bonnet. The engine is 4½ x 4½ in., and the water jackets are formed integral with the cylinders. The unit is anchored through four integral lugs to the side rails of the main frame, heavy steel bolts being used.

The cylinders, which are formed with heavy flanges, and the pistons are made of the same material and are carefully finished. There are four ¼ in. compression rings, three of which are carried above the 1⅜ in. hardened and ground wrist pins, the other below. The pins are held in the rod and have the advantage of a little more bearing surface in the piston bosses.

The connecting-rods are drop forged steel of the usual I-beam type and are fitted with plain bearings. The pin bearings are 1¾ in. diameter; the two sections of the bearings held in place with two ⅜ in. steel studs, lock nuts and cotters.

The crank shaft is a solid drop forging, 1¾ in. diameter, bearings plain, formed in the crank case end cover plates. These plates are round in form and are bolted to the crank case through six 7-16 in. steel studs to each bearing plate. These are easily removed when necessity may require.

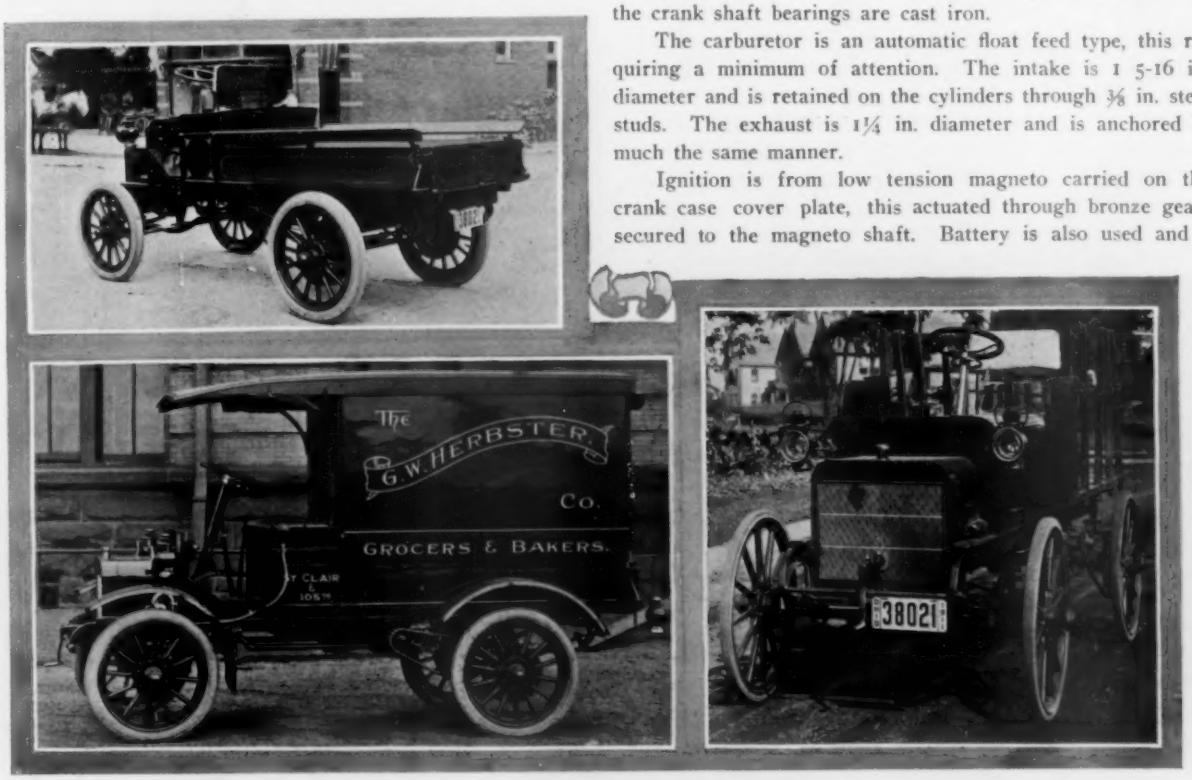
The valves, which are beveled at 45 deg., are 1 11-16 in. diameter, the heads being cast iron welded to carbon steel stems, stems ⅜ in. diameter. The push rods, 1 in. diamter, are pinned to prevent turning and operate in bronze guides in the crank case. The cam shaft is ⅞ in. diameter, the cams formed integral. The fly wheel, which is a six spoked fan, is 20 x 2⅝ in.

Crank Case, Carburetor and Ignition

The crank case is made of cast iron and to this the two cylinders are anchored through six 7-16 in. steel studs. The top of the case is aluminum and the end plates which carry the crank shaft bearings are cast iron.

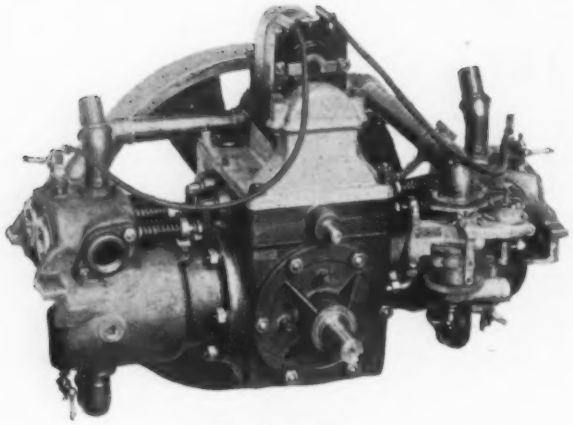
The carburetor is an automatic float feed type, this requiring a minimum of attention. The intake is 1 5-16 in. diameter and is retained on the cylinders through ⅜ in. steel studs. The exhaust is 1¼ in. diameter and is anchored in much the same manner.

Ignition is from low tension magneto carried on the crank case cover plate, this actuated through bronze gears secured to the magneto shaft. Battery is also used and a



Mora Body Types

These illustrations show a front view of the stake-body type, with large radiator; rear view of express-type body, with substantial rear construction, and a special construction of enclosed type body, fitted with pneumatic tires



The Mora Motor

View of motor from the rear, showing accessibility to every part. The method of mounting magneto, together with location of carburetor, can be seen

coil is carried on the dash. The magneto, like the carburetor, is controlled through a hand lever under the steering wheel, this fitted with a large ball which insures an easy finger grip.

Lubrication—Thermo-Syphon Cooling

Lubrication is from force feed, mechanical oiler having six leads which amply cares for all bearings of the motor. This instrument is driven through an eccentric on the cam shaft. The oiler located on the dash affords knowledge of the oiling, the system being adjustable. An oil ring is carried on the crank shaft and this further insures proper oiling, together with splash in the crank case and constant feed from the mechanical oiler.

The thermo syphon system of cooling prevails here. The cooler is of conventional type, that is of the square tube variety, 24¼ x 17¼ x 2½ in.

Planetary Transmission

Drive from the engine to the transmission is through a universal jointed propeller shaft, this 1⅛ in. diameter. The clutch is of the multiple disc type, fully enclosed in the transmission case and easily and permanently adjusted, having eight plates 8 in. in diameter. Gears in this two speed transmission are ⅞ in. face, main shaft 1¼ in., planets ¾ in. face. At each end of the main shaft ball bearings are used. The high speed is controlled through a spring check. At the low speed the clutch is inactive and the gears are active. At the high speed the clutch is active and the assembly operates as a unit. The transmission bands which are easily adjusted, are faced with a Scandinavian lining.

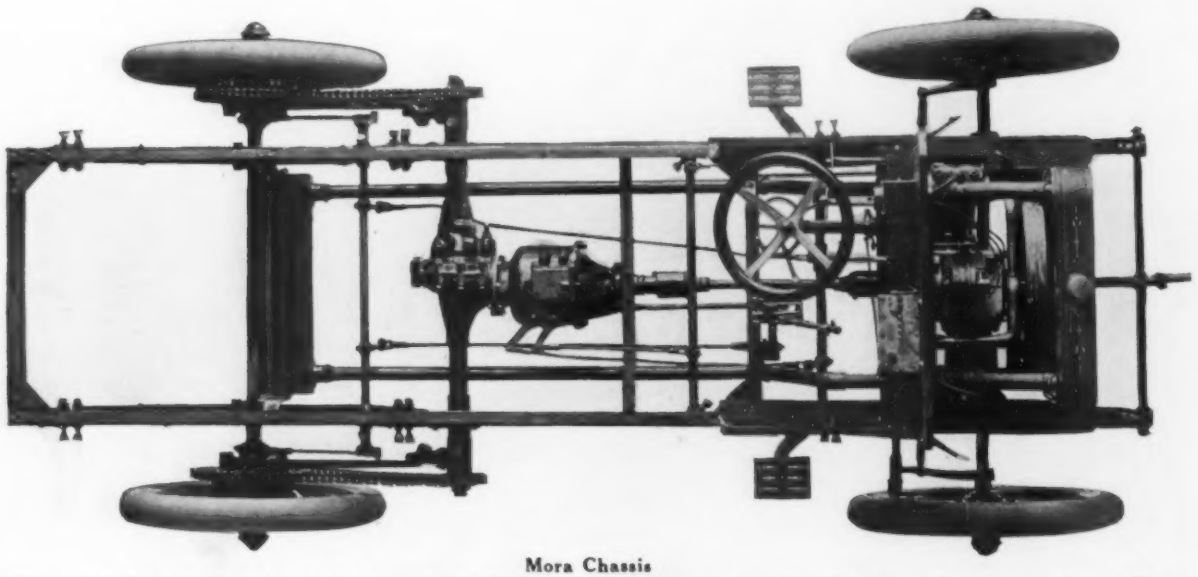
Support of the transmission is at three points, at the jack shaft outboard brackets on the side rails of the frame and forward at center to a cross member of the frame.

The differential is a unit with the transmission, the case being cast iron. Bevel pinion and driving bevel are 1¼ in. face, 4 pitch. The driving shafts are 1¼ in. in diameter; Hyatt roller bearings used outboard, these being 4 in. long with ½ in. rollers. The four differential pinions are ¾ in. face. The front driving sprockets are either of 17 or 19 teeth, as the service may necessitate, and the side chains are 1 in. pitch with 9-16 in. rolls. The driving sprockets are keyed to the jack shaft on a taper. At each side of the differential cup and cone ball bearings are used, button thrust at the ends of the jack shaft. The rear sprockets are bolted to the cast steel brake drums.

Frame and Springs

A pressed steel frame is used, this 140 in. long, 34 in. wide. A 1 in. steel tie rod extends from the forward end of one frame rail to the other, the idea being to stiffen the construction at this point. Gusset plates are used at the rear cross member. Side rails are straight throughout.

Front and rear springs are semi-elliptic in form, anchored in the usual manner. A departure, however, is the method of anchoring the rear ends of the forward members. That is a combination bracket is fitted which supports the rear end of the front spring, also serves as a step hanger and supports the pedal rocker shaft. This member is a malleable casting.



Mora Chassis

Top view of chassis, showing coil and oiler mounted on dash. The muffler, with its two pipes from the engine, is hung from the frame. The transmission, just forward of the jack shaft, is of the planetary type

All spring eyes are bushed with steel. Front springs are 39 x 2 x 6 in., rear 43 x 2 x 11 in.

Axles and Brakes

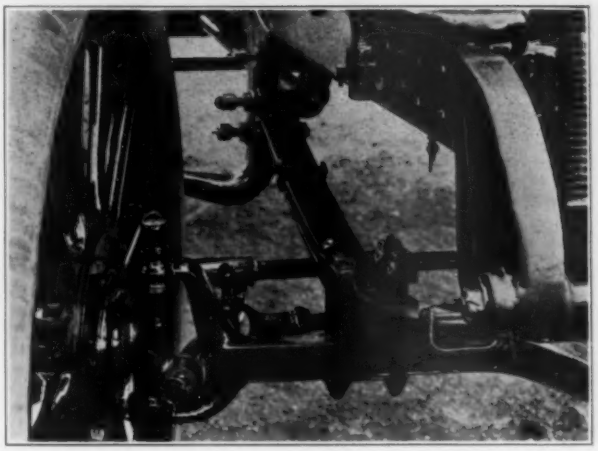
The rear axle is a forging 1½ x 2¼ in., the front being 1½ in. square, center dropped and formed with integral yokes. Wheel bearings are cup and cone type, and are made up of ¾ in. steel balls inside, ⅝ in. balls outside. The same size bearings are used on front and rear wheels.

The wheels are wood, artillery, sype, fourteen 1½ in. spokes rear, twelve of the same size forward. The wheel hubs are heavy gage pressed steel. Wheel diameter is 36 in., and either solid or pneumatic tires may be had.

The cast steel brake drums are 10 x 2½ in., these clipped to each of the spokes of the rear wheels. Operation is through foot pedal and hand lever in the center of the floor board. These rear brakes are supported by the radius rods extending from the jack shaft housing to the rear axle. The brake pull rods are ⅜ in. diameter, adjustable and the rocker shaft is 1 in. diameter.

Steering and Control

Steering is through worm and nut system, 16 in. wheel, 1½ in. post. The tire rod is 13-16 in. diameter, drag link ⅞ in., ball and socket joints, spring check each end of the link, assembly back of the front axle. The car is steered from the left, with spark and throttle levers under the steering wheel.



A Mora Detail

This cut shows the big pivot bolt and sturdy steering knuckles. Also combination step, spring and pedal-shaft hanger

The low speed, reverse and brake are actuated through pedals.

Bodies

The Mora light delivery chassis may be fitted with any type of body depending on the service. The standard types are stake and open express equipped with which the car sells for $1000 f. o. b. Cleveland. Loading space in either car is 45 x 80 in.

THE M AND M ECONOMIZER

A new device known as the M and M Economizer made by Moller Brothers Controller and Economizer Company, No. 700 Betz Building, Philadelphia, and which has been in use for the past two years, is somewhat in the nature of an auxiliary air inlet, to be inserted in the intake manifold and operated by a small pedal, is being distributed by the well-known accessory house of Jas. L. Gibney & Brother, 215-17 N. Broad Street, Philadelphia.

This little device is very much like a small brass double poppet valve. It is screwed into the intake manifold, using a standard pipe thread nipple and a small lever on same, is connected by wire cable to a pedal arranged on the floor boards, after the fashion of an accelerator pedal. By pressing this pedal very slightly after the engine is running and the car in motion, a small amount of air is allowed to pass into the inlet pipe at right angles to the flow of the mixtrue, thus diluting same, and helping to break it up and make a better mixture. The first pressure on the pedal opens a very small central valve set in the main valve. More pressure opens the main valve, and if this is opened full, no gasoline is used, the engine drawing its contents through the valve and not the carburetor. In going down hill when opened full the air for the engine is taken directly through the valve, and this air passing in and out of the cylinders cools them. In case of a back fire, it acts as a safety valve, thus protecting the carburetor and preventing the destructive action of severe back fires. The claims made for it are: better mixture, more power with less fuel, better control of the engine, cooling effect, prevention of back fires in the carburetor, and above all economy of operation, and, in a demonstration given the writer, this device did all that was claimed for it. Price complete, including pedal and woven wire connection, $3.50. A free trial of 30 days is also allowed.

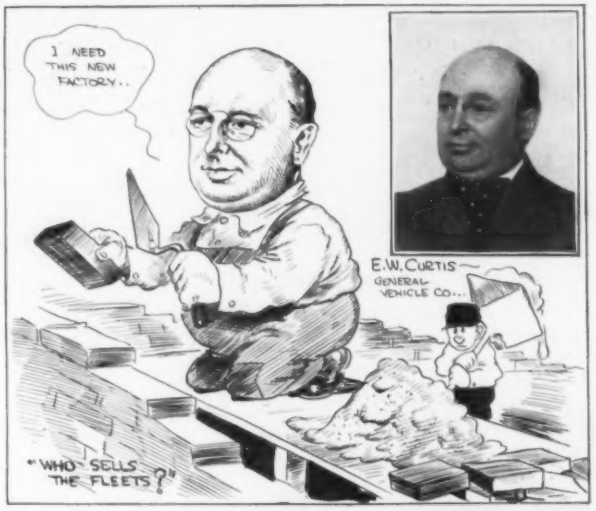
THE MACK POST-HOLE DIGGER

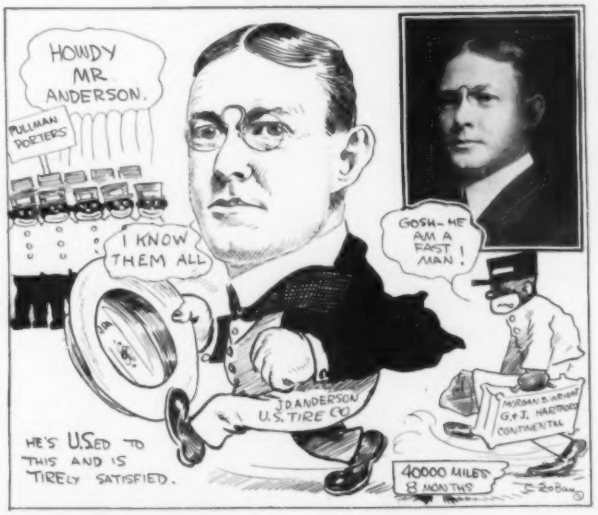
We have been informed by the Bell Telephone Company, of Pennsylvania, Philadelphia, Pa., that credit for the design of the Mack Post Hole Digger and Setting Machine described in our May issue, Page 58, should be given to James Cunningham, Supervisor of Construction of the Bell Telephone Company.

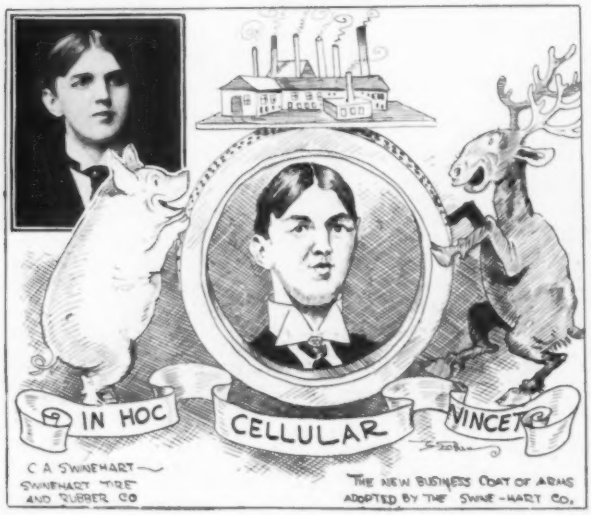
The Bell Company states that the auger and booms have been used for the past three years. They were placed on a horse-drawn truck and were operated by a seven-horse power gasoline engine mounted on this vehicle, and were only recently applied to the truck.

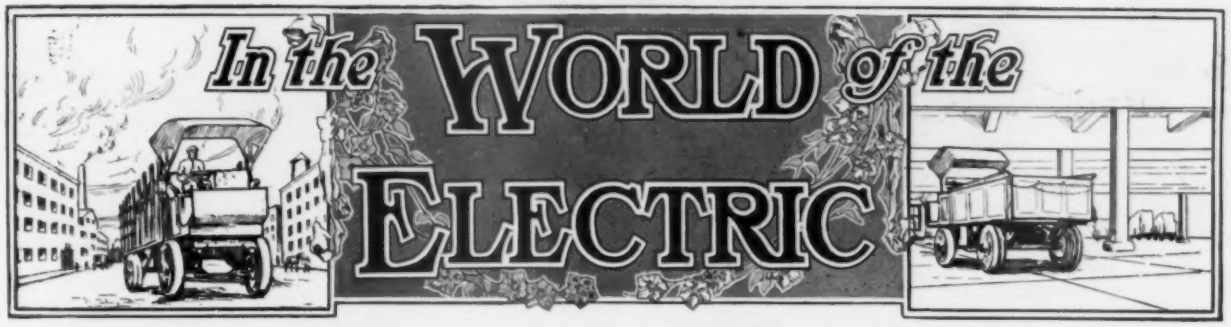
NEW YORK MOTOR TRUCK CLUB has voted to present a gold medal each year to the policeman, who, in the course of a year, proves himself to be most efficient as a handler of street traffic. The club has also appointed a committee to draft the conditions of award and other details.

C.C.J. GALLERY of SALES MANAGERS



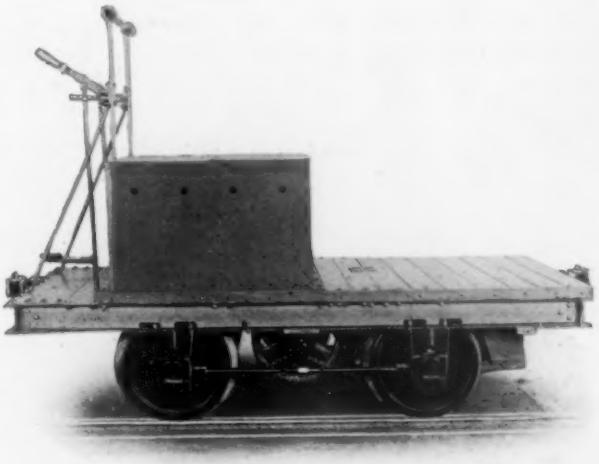






The Use of Electric Motor Trucks for Hauling Freight and the Transfer of Other Merchandise

THE increasing demand for a more efficient means of handling and transferring freight and other merchandise, than by the ordinary hand truck, has necessitated the introduction of a motor truck. The Automatic Transportation Company, of Buffalo, N. Y., are the manufacturers of such trucks, and they have been favorably looked upon by those who have need for their use. Their trucks, called "Electric Transportation Devices," are being used extensively by industrial plants and warehouses, as well as by railroads and steamship companies and at the present time several automobile companies are using them for hauling in and about their plants.

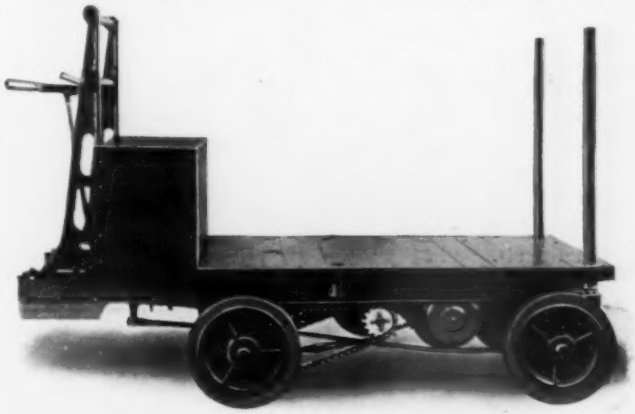


Trucks for Shifting or Hauling Rail Cars

Note method of attaching journa boxes to frame, with slots in T iron to permit of adjustment by means of distance pieces with turnbuckle. The coupling can also be seen, as can the storage-battery housing and the control mechanism, with foot lever.

The accompanying illustrations give one a fair idea for what purposes these trucks might be used. A truck, like the one pictured with the tail piece down or the one with the bars in upright position might be used for handling miscellaneous freight and bulky packages. The truck with the large side dump body of very strong construction, affords an excellent means for the transfer of sand, coal, ashes, etc. There is also shown a truck which runs on railroad tracks and has couplings attached for the hauling of cars.

An idea of the efficiency of these electric trucks can be derived from the statistics of the freight handled at the Erie Terminal in Jersey City. Between 550 and 650 tons of miscellaneous package freight is handled daily at this pier by twenty of these trucks, and previous to the installation of the



Storage-Battery Truck With Portable Bars

This type is probably best adapted for carrying packages and less bulky articles. Two other bars like the ones shown can be placed in the holes at the center of the truck. The large box at one end contains the storage batteries, and directly back of this is shown the control mechanism.

present system the work of transfer was done enirely by hand-trucking. The freight includes a large percentage of boxes, barrels, sacks and similar packages, but there are also many bundles of miscellaneous character, such as steel, pipes, machinery and uncrated goods of irregular shapes.

Freight-Handling Equipment

The equipment for handling the freight at this terminal consists of the ordinary hand trucks for local movements of certain

Electric Truck With Tailpiece Down

The Automatic Transportation Company, of Buffalo, N. Y., are the manufacturers of this truck. The tailpiece can be used to aid in getting heavy merchandise on the truck, which has a carrying capacity of three thousand pounds

Motor Truck of the Side-Dump Body Type

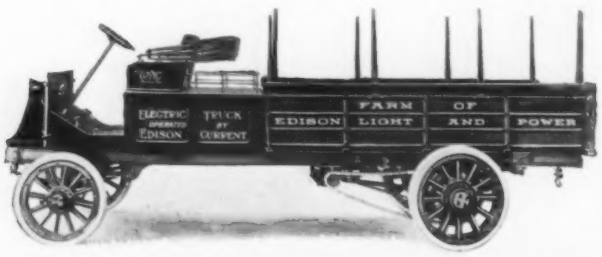
This body, of the side-dump type, as seen in the cut, is pivoted in the center and has steadying posts on both sides; those on the one side being of such construction as to permit releasing and allowing the car to dump. The body, with its hinged sidepiece, is very substantially built and reinforced all around, giving it rigidity.

packages and 20 electric storage-battery trucks, of the type manufactured by the Automatic Transportation Company, of Buffalo, N. Y. The platform of these trucks affords a loading space of 3 ft. 6 in. by 7 ft. 1 in., and is 20 in. above the floor. They have a capacity of about 3,000 lbs. and operate at speeds up to 12 miles per hour. The sides are open, while the ends are closed at the front by a rigid steel box containing the batteries and at the rear by a steel-bar gate, hinged so that it may be lowered over the end of the I-beam underframe to form an extension of the platform. The trucks are equipped with steel wheels, 16 in. in diameter, with solid rubber tires, the steering wheels being mounted so as to turn on a rigid axle like automobile wheels. The drive wheels are chain-driven from a 2½ h. p. motor, hung from the underframe. Five speeds forward and back are provided by a controller. The truckman or motorman stands on a small platform in front of the battery box and has the control and brake levers at his hand, both of which operate vertically through an arc of 120 deg. Emergencies are provided for in an automatic foot lever on the platform, which must be kept pressed down in order to release the brake or apply the power. As soon as the motorman's foot is removed from this lever the power is automatically cut off and the brake applied.

THE "ELECTRIC" FARM

The "Electric" farm is the latest thing to bring out the wonderful progress made in the use of electricity and to prove its diversified advantages. This unique institution is located in the outskirts of Boston and operated by the Boston Edison Company. With the installation, a short time ago, of a two-ton G M C electric truck, its title to the name "Electric Farm" is indisputable.

Electricity does everything on this up-to-the-minute establishment. It cuts the fodder, milks the cows, washes the dishes, pumps the water, churns the butter and finally takes the product of the farm to the city in an electric truck. It is thoroughly electrified and is attracting considerable attention, for thousands of Boston people visit the farm every week.



The G M C Two-Ton Electric Truck Used on the "Electric" Farm

Electric Used by United States Government

The car illustrated is a one-ton Detroit Electric, purchased a year ago by the United States Government for use at the Rock Island Arsenal, which is situated in the center of the Department of the Mississippi Valley, at Davenport, Ia., and Rock Island, Ill. A report given out on the performance of this car reads as follows:

"During the year which the car has been in service it has been on the road every day and has been traveling as high as sixty-five miles on one charge. Every day regular trips were made to the post office with mail, and roads broken when the snow in some places was three, four, or five feet deep. Not a single trip was missed during the entire year, with the exception of one day, when the car was sent to the garage for inspection."

CARTAGE COMPANY EMPLOYS THREE AND A HALF TON ELECTRIC

Owing to the peculiar conditions which surround the service of the Riverside Storage and Cartage Company, Detroit, Mich., a three and one half ton electric commercial car meets requirements, the radius of activity being within four miles of the base. Satisfaction is expressed with the car as it has come up to the guaranteed requirements, and is estimated that, with proper care, which the company will bestow, the vehicle should last ten years. An electric is favored because of simplicity of the construction and the fact that any of the teamsters can operate the vehicle.

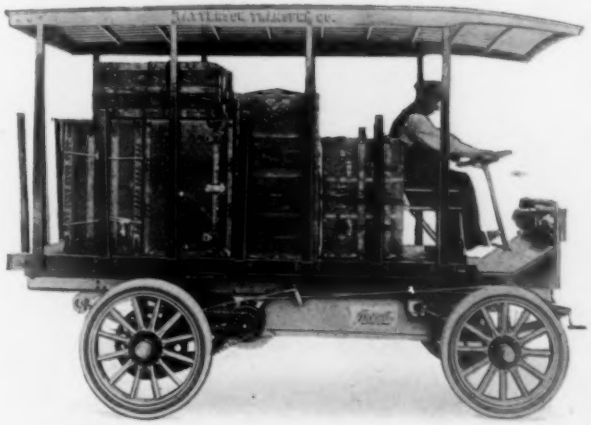
This three ton electric, General Vehicle make, purchased last November, employed throughout the past winter without interruption of service, is operated at a cost of 90 cents per day for current. The company generates its own current so that the cost is lowered accordingly. Although of three and one half tons capacity the car is seldom loaded to this amount. The loads handled are bulky but not always as weighty as might be

General Vehicle Three and a Half Ton Electric

Three and a half ton General Vehicle Electric Commercial Car, used in Detroit, by the Riverside Storage and Cartage Company, for hauling within a radius of four miles. The outfit is stated to be twenty per cent more economical than horse-drawn vehicles of like capacity.

expected. For this reason the owners feel that they should derive good service from the car, as they are well within the margin of safety under all conditions.

The body, which is painted white and handsomely finished, was built in the company shops, is 14 ft. 10 in. long, 6 ft. 10 in. wide, and 11 ft. 3 in. is the distance from the ground to the top of the roof and has a capacity of 504 cu. ft. It is stated that the car is unquestionably an advertising asset, being very neat and trim in appearance, attracts attention everywhere and is a most forcible advertisement for the firm whose two model mammoth warehouses are pictured on the body panels. Obviously the vehicle is such as to cause one to regard the owners favorably when requiring anything in their line.



Detroit Electric Used by Transfer Company

During the hot summer months of 1911, the Patterson Transfer Company, of Memphis, Tenn., placed in service a one and a half ton Detroit Electric car, which since that time has been on duty every day, not missing a single trip, and has replaced two horse-drawn wagons which were formerly used by this company. Besides the cost of current and the driver's wages, the operating expenses have been practically *nil*. Trunks and baggage are now handled with a promptness and dispatch which was heretofore impossible, and the company states that this machine has given a decided impetus to their business.

PROVISION HOUSE DISPLACES ITS HORSE SERVICE WITH ELECTRICS

Old Delivery Schedules Now Abandoned

To entirely do away with horses for delivery of groceries and meats is a forcible indication that the up-to-date method does the work far better, and such is the explanation of the W. W. Walker electric service. This house, engaged in the sale of groceries and meats in Hartford, Conn., and, regarded as one of the best in that community, has experimented with all types of cars, gasoline trucks, rebuilt pleasure chassis and electrics of one type or another. The net result is that the electric delivery wagon is regarded as best suited to the peculiar delivery conditions of the Walker service.

It is obvious that to set aside horses and take up cars in a country where there are heavy snows in winter one must be firm in the conviction that the course is the proper one, and,

One of a Fleet of Light Electric Delivery Wagons Which Have Displaced Horse Delivery. These cars are kept on the move constantly and there is but one set delivery, that at 7.30 in the morning.

well, those responsible here have had no occasion to regret the change. The electrics are doing very good work and doing it every day in the week.

Old Schedules Set Aside

In order to make the best use of the fleet of electrics, the service must be continuous. The usual method is to collect bundles and parcels for a given route and if there are not enough to make a load, why, the driver simply waits a while and the waiting means idle equipment and in itself means loss; though it may be small it counts up in the end. When the fleet of electrics was installed in the Walker service the old horse delivery schedules were set aside and the only set time of departure now is 7.30 in the morning. This trip is made by a 1000 lb. Detroit electric which goes to the south end of the town as far as Adelaide Street, then the car takes a cross-town route to Fairfield Avenue and New Britain Avenue in the extreme southwestern section of the city. The return back to the store is by way of Zion Street. This car makes a second trip at ten o'clock and goes out the "hill" section, that is, about due west from the store. The bulk of the store trade is in this section. The other five small electrics discharge their loads in whatsoever section they may have to operate and return when

the work is completed. In this way the city is well covered and deliveries are made in quicker time than formerly, with horses.

For the local work, that is for deliveries close to the store, 750 General Vehicle cars are used and even on the short hauls the cars do very good work. There is but one man to each car so that the cost of operation is materially reduced.

What it Costs

The fleet of electrics has been in use for some months and the tire cost figured for all four wheels of each car will vary from 1¼ to 1½ cents per mile. As to charging, the cost for this is set down at 1¼ cents per mile. The batteries are charged at noon while the driver is at lunch. There are two batteries for each wagon, so that no time is lost. When the driver returns his vehicle is ready for him.

It is estimated that one electric car is as good as a pair of horses and team and the cost of the horses for feed alone would be $50 a month. Another thing to consider is that the horses would be used only half a day, if active in the morning the animals rest during the afternoon or vice versa.

Horses in this service are good for about two years. After that time they become slow and, while of value for other work, will not do here. The price of new horses runs from $250 to $275 each, and at the end of the two year period of usefulness the price realized in sale would be about $150 each.

It is estimated that all cost of the electrics will be covered by $6 a day, this considering all items. Average mileage is forty.

Truck for Freight

A one-ton electric truck is used to carry freight from the shipping centers to the warehouse and store. This car is kept on the move pretty much all the time and is well able to handle the business.

Supply Car

Saturday is the biggest day of the week, and in order to work the electrics to the best advantage a gasoline car of the converted pleasure type is used to supply the lighter delivery vehicles which saves the run back to the store. Friday, too, is apt to be a heavy day so that the gas car is used to good advantage for the same purpose.

CONTRACTOR PREFERS ELECTRICS FROM EXPERIENCE

Electric commercial cars are preferred by the Albert A. Albrecht Company, general contractors, Detroit, Mich., statement based on experience with gasoline and electric types. At present two electrics of General Vehicle make are used, one of 2 tons capacity, the other of 3 1-2 tons and the service is very satisfactory, which the owners state they could by no means say of the former gas car used. The smaller electric has been in service about a year and a half, the larger having been purchased last February. The two ton car has been refitted with tires in that time and it is stated that repairs have been so slight as not to be at all compared with the gasoline car formerly used. For a month current cost $11.50 or less than 45 cents per day. One driver is paid $15 per week, the other $16 a week. One is experienced and used to drive the gas car, and both live over the garage.

The Electric Truck Used by Contractor in Detroit; loaded with terra-cotta viaducts

The cars are kept in a combination garage that service for pleasure types as well. In one part of the building the horses are housed. In one wing is the machine shop. The company, since it has need of hoisting engines and other construction apparatus, finds it advantageous to make its own repairs.

The gas car used, it was pointed out, was undependable and delay caused not only meant time loss but ate up the profits as well. The electric service has proven very satisfactory and the cars are used for general work which embraces long and short hauls. Speaking of performance it was pointed out that the car had been sent away at 7 o'clock in the morning with a full load for a run of 15 miles and was back ready for another load at 11 o'clock. The trip out and back would have required nearly a day for a horse outfit. "Horses are all right but make them haul a heavy load for four or five hours straight and the steady pounding on the pavements becomes punishment" was stated.

Ice Cream Company Uses Electric

The cut shows a three thousand pound Detroit Electric operated by the Luick Ice Cream Company, of Milwaukee, Wis., which has taken the place of three horse-drawn teams and is making an excellent record for efficiency and economy. In the delivery of ice cream the manufacturers claim the use of an electric car is advantageous owing to the necessity of repacking the tubs. After each delivery means long stops, during which time there is no fuel consumption. Two men are employed in operating this vehicle. The car is equipped with an Edison battery consisting of 60 A-6 Edison cells. About thirty to forty miles are covered per day.

THE WAVERLEY COMPANY, of Indianapolis, Ind., has just added a five-ton truck to its line. The truck is 17 ft., 8 in. long and has a carrying space of 14 ft. by 6 ft., 6 in. wide, and weighs 11,020 lbs., the battery alone accounting for 2540 lbs. of weight.

MOTZ TIRE & RUBBER COMPANY, Akron, O., have opened a Dayton, O., branch at 2352 Euclid Avenue, in charge of C. R. Serfoss.

Some London Express Delivery Work

BY OUR FOREIGN CORRESPONDENT

TO GIVE an idea of what is being done in Europe in the way of express work by automobile, I have selected London as an example; firstly because the use of the motor for this class of work has been developed more fully in that city, and partly because London probably offers greater difficulties to motor express work than any other capital of Europe. This is in part owing to the fact that the British Metropolis is an ancient foundation that is the growth of ages, and consequently, has been arranged on no definite plan, with many narrow streets and comparatively few main arteries of traffic. Accordingly in London, street traffic is more congested than in any city of Europe. Paris with its comparatively light traffic, Berlin a comparatively modern city excellently arranged and Vienna with its broad thoroughfares—all these afford in the main, easy conditions of work compared with London, for, after all, in motor express work the congestion of the slower traffic forms the limiting factor.

As the London expressing business is, generally speaking, in the hands of a comparatively few firms, these are large, important, and mostly old established businesses. One of the oldest is the firm of Carter Paterson and Company. Dealing as it does solely with the express delivery of goods, Messrs. Carter Paterson's business is necessarily very highly specialized and involves delicate and careful handling. For practical purposes, it may be divided into three different types of work. Firstly, the "point to point" work. The delivery area covered by the firm in and around London exceeds an area of 420 square miles. Such an extent can only be served by apportioning it, so to speak, into sections, each with its own delivery center. Accordingly, throughout the area branch depots are located, and these serve as distributing centers for the goods that are sent to them from the firm's headquarter premises in Goswell Road. It is the transport of the parcels from the headquarters to these distributing centers that is known as "point to point" carriage, and for this work, after trying several types, a van of 3-ton capacity has been found best. In fact, Carter Paterson have adopted the 3-ton as standard for this work, as they found that the five-tonner was too slow for express deliveries, for on such work the trucks have to hustle, and wherever possible run all of the 12 miles an hour allowed by law. Of course, the speed they average depends a good deal on the state of the traffic, some trucks having to pass through many more miles of heavy traffic than others, but as a general thing, they do a good 10 miles an hour. Such work, of course, is entirely non-stop running, for it does not pay to be continually stopping and keeping idle vehicles like these three tonners; in fact, James Paterson considers that a 12 mile trip is, at present, the shortest distance, under the circumstances justifying the use of the 3-ton trucks from a commercial standpoint. The three-tonners are, however, not only used for point to point

A Fleet of Carter Paterson's Vans Taken at Their Acton Depot. With the exception of the two one and a half ton vans to the right of the picture the rest are two and a half and three-ton vehicles

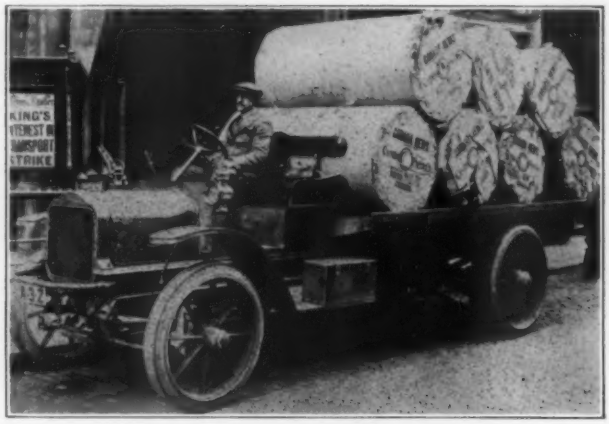
A Rough Map of the London Delivery Area of 420 Square Miles Served by Carter Paterson, With the Chief Depots Indicated. The areas contained within the dotted lines indicate home-counties districts, each served from its own central depot.

non-stop work within the London area, for the firm has direct long-distance motor services to outlying towns like Margate, Hastings and Brighton, all of course, non-stop runs on which work such a truck can perform anything up to 120 miles a day. On the point to point trips, however, within the London delivery area, 60 to 80 miles is as much as a car can be expected to average.

Being one of the old established firms of carriers, Carter Paterson, of course, has in its time had occasion to use many thousands of horses, so their opinion can be regarded as one very fully cognizant of both sides of the question. It was all the more satisfactory therefore, to learn that they had found the automobile to show a marked superiority over horse traction, both in time and money. In fact, Mr. Paterson spoke most favorably of his three-tonners (most of which are Leyland trucks) for point to point work, which, I believe, average out to a working cost of 17 cents to the mile.

The second type of commercial car used by this firm is used for the distribution of parcels from the branch depots direct to the houses of the public, and for this purpose a 40-50 cwt. van is employed. Some time ago the firm tried 30 cwt. trucks for this work, but these were found to afford hardly enough loading capacity. Naturally on "delivery work," as it is called, the stops are comparatively numerous, and consequently, although the cars are run probably at well over 12 miles an hour, they only average between 7 and 8 miles an hour.

As the third variety of delivery work is contract work undertaken for large stores and business houses, it hardly comes within the scope of the present article, but we shall hope to deal with this aspect of commercial automobile working at no distant date.



Service During Strike Sells Motor Truck

During the widespread teamsters' strike in England, which tied up practically all horse transportation in London, a White three-ton truck was employed by the London Daily News to haul its supply of paper from the docks to the publishing office. If it had not been for the motor truck the Daily News would have been forced to suspend publication during the strike. The truck performed so satisfactorily in this emergency that the Daily News has decided to continue its drayage by the motor truck method.

KNAPP COMPANY, of Essen, Germany, has patented a military motor car, having been designed to carry a quick-firing gun for use in military operations. The platform is constructed along certain lines. The frame of the automobile is so arranged as to accommodate a pivot stand, which is firmly attached. Rotably mounted in the pivot stand is a fork shaped upper carriage movable by means of a vertical pivot pin and ball bearings. The gun platform is equipped with a shied.

Municipal authorities of Paris are making an interesting experiment in the way of using motor trucks for collecting household wastes. In order to find out which type is best adapted for such special use, both gasoline and electric machines are under trial.

WHAT MOTORIZING MEANS

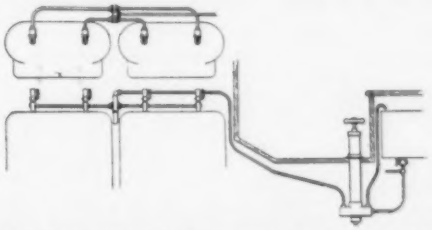
Some idea of what motorizing a police department means is to be had from the statement of Commissioner Croul, the energetic head of the Detroit police department, who firmly believes in cars, when he says that, in the event of serious trouble he would be able, by means of the cars now in service, to merge at any one point in the city, in a few minutes, about 109 men. Think what this means. A company of trained men, fully equipped and ready for any emergency. Under such conditions rioters have no chance. He states that Detroit is no longer infested by the saloon brawlers always ready to muss things up, and this clean up is largely due to the rapidity with which the police get to the scene of action. Commissioner Croul is highly enthusiastic about motor cars for police work, and to illustrate just how much they mean to Detroit, intimated that the whole fleet could be run into the river at the end of a year and yet would have already paid the city in the good work done. When asked if there was any comparison between horses and motor cars for police work he grinned, and his final expression was to the effect that there was not.

Gasoline Engine Starters for Commercial Cars

A Review of the Automatic Engine-Starting Devices Applicable to Commercial Cars—(Continued)

NORTHEAST GASOLINE MIXER AND STARTER

The Northeast Electric Company, of Rochester, N. Y., is putting out a gasoline mixer and engine starter of very simple construction. The hand pump located near the driver's seat contains a gasoline mixing chamber furnished with gasoline from the usual tank. After the motor has stopped the pump



The Northeast Electric Company's Starter and Mixer

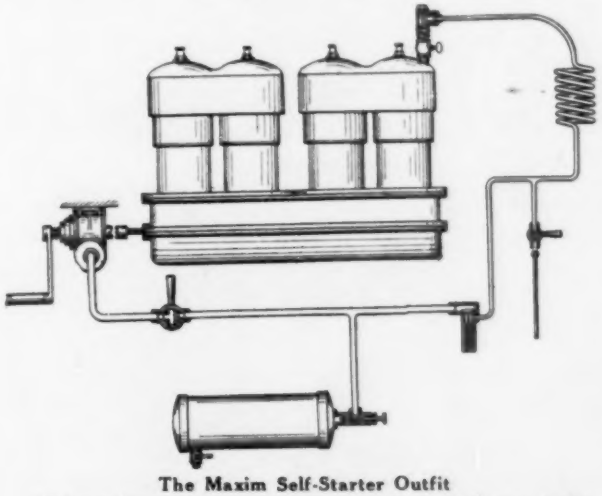
The Northeast Electric Company's Gasoline Mixer and Starter installed on motor; showing location of pump, with mixing chamber in the base

handle is pressed downward to engage a small valve with a half turn. The handle is then pulled upward, drawing gasoline and air into the mixing chamber of the pump. The downward stroke forces the mixture through the rotary selective valves into the cylinders. The motor should now start by operating the spark.

THE MAXIM SELF-STARTER

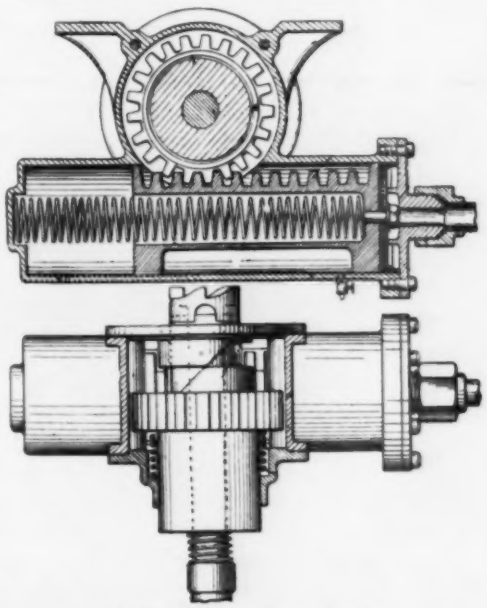
Patents have been allowed Hiram Percy Maxim, Hartford, Conn., on a new self-starter, which is rather novel in construction, yet simple and devoid of complications. Mr. Maxim, who was formerly chief engineer of the Electric Vehicle Company, well known throughout the industry and who later turned attention to the development of a firearms silencer, has been at work perfecting the device for the past two years. It is purely mechanical and the construction is set forth in the accompanying drawings. Briefly stated, gas is taken from the cylinders, stored in a tank and led to a small starter when needed, by opening a dash valve. The exploded gas from the cylinders, controlled through a ball check valve, is led through a cooling coil to the storage tank and the action is entirely automatic.

The starter is located on a cross member before the engine shaft, or may be attached to the crank case. The device is a simple pinion meshing with a rack, the latter forming a



The Maxim Self-Starter Outfit

The cut shows the starter and its accessories attached to an engine. The special features here shown necessary for the operation are: the ball valve on the engine cylinder, the cooling pipe, check valve and tank. Then there is a three-way valve located between the tank and air delivery and finally we have the starter itself.



Maxim Self-Starter in Detail

Here is shown the detailed mechanism of the Maxim starter. The small pinion, meshing with the piston rack, causes the starting shaft and dog to engage with the crank shaft. A cross section of the piston rack is shown, exposing the spring which returns it to the starting position.

piston in a small cylinder. The gas from the storage tank led to the starter forces the piston rack through its stroke and revolves the pinion. The first motion of the pinion thrusts the hand starting shaft and dog into engagement with the engine crank shaft and the succeeding motion turns the crank shaft until the piston nears the end of stroke, when a cam face disengages the dog or clutch from the engine shaft. A spring returns the piston.

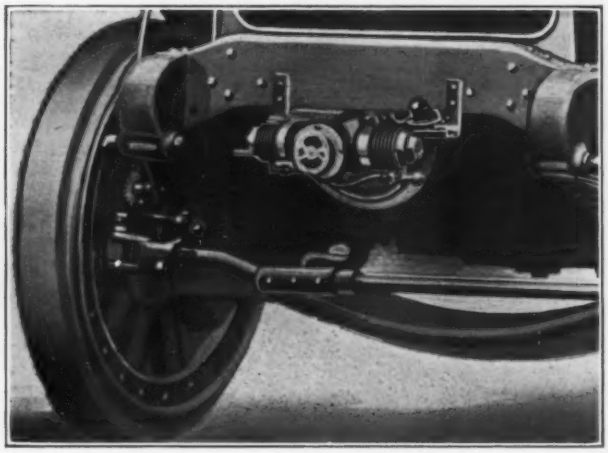
A small pipe from the tank runs to the dash and connects with a small three-way valve by opening which the gas is permitted to pass from the storage tank to the starter piston and by closing it the gas is shut off, while the gas in the starter piston is exhausted, the spring above noted forcing the piston back to the initial position. As will be noted from the drawings all practical conditions, such as over running of the engine, back

firing or even entire loss of gas are provided for. At each end of the stroke of the piston the clutch dogs disengage so that the engine may oscillate or overrun as much as desired. In the event of back kick, the angle of the engaging dogs simply disconnects the starter by means of the cam faces on the pinion. Should there happen to be no gas through leakage, or otherwise, the engine can, of course, be turned by means of the usual hand crank. The size of the piston is such that a very vigorous turning is imparted. It can be repeated over and over again, limitation being the gas in the storage tank. Skill in manipulation of the starting valve is not required, as it makes no difference whether the valve is held wide open for some time and then closed or quickly opened and then closed.

This device can also be used for tire inflation, suitable connections being provided or the purpose. A needle shut-off valve to the tank is only provided to avoid leakage from the tank during periods of laying up. The mechanical simplicity of the starter and its direct operation render it well adapted to commercial car usage.

THE CRESCENT AIR SYSTEM

The starting device consists of a semi-circular cylinder in which operates a piston with a semi-circular connecting rod attached to a crank arm. This crank arm is mounted on an extension of the engine shaft and the entire machine, including a double opposed air compressor is bolted to the



Crescent Air System Installed

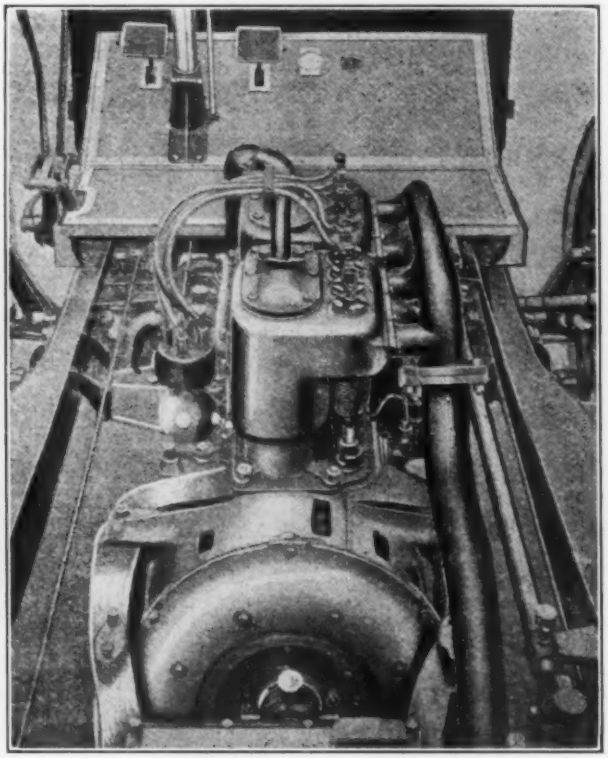
The cut shows a Crescent Air System installed on a motor truck. The double cylinder opposed compressor is shown, behind which is the starting device.

frame directly in front of the radiator. When the compressed air, which is carried at 250 lbs. pressure, is admitted to the curved cylinder, it forces the crank arm through a one-half turn with such power and velocity that the crank shaft of the motor is given one and one-half to two and one-half complete revolutions, depending of course on the compression and bore of the motor. The crank arm returns immediately to its normal position and the operation can be repeated so quickly that the effect of spinning is obtained even in the largest motors.

The compressed air is stored in an electrically welded steel tank, about the size of the ordinary muffler, and located underneath the body of the car, usually directly opposite the muffler. This system is claimed to crank the motor, inflate tires, dust the car, operate pneumatic jacks and sound signals. In front of the starting device is a two cylinder opposed compressor, which has connection with the crank shaft and can be operated at will from dash. This compressor fills a tank to the desired amount of compression, from which it is led at will to the starter. The complete outfit as manufactured by the Crescent Air System Manufacturing Company, Detroit, Mich., sells for $130.

THE U. S. L. SELF-STARTING MOTOR-GENERATOR

The U. S. L. Electric Self-Starter and Lighter is a special motor-generator or dynamo which is applied in place of the usual engine fly-wheel. By its use no hand cranking is required, while it is claimed to furnish a practically unlimited supply of electric current for use in cranking the engine, as well as for electric search, side and tail lights, ignition, flashlights,



Motor-Generator Installed

The cut shows the U. S. L. Self-Starting Motor-Generator as applied to a motor. This device is so designed as to take the place of the flywheel and therefore adds no extra weight.

electric illuminated signs, etc., all of which is done without added operating cost, as the electric current is generated by the gasoline engine from the surplus power.

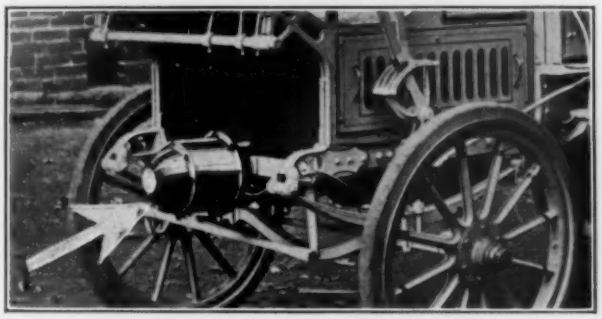
The device is purely an electrical one in character, of special design, with no loose parts or wires that interfere with its successful operation, and it is said to be an impossibility to overload it. To crank or start an automobile with the U. S. L. Electric Starter, it is only necessary to press a push button, when the device will immediately crank the engine ten times, one hundred times or several thousand times, doing it as often as may be needed to start the engine running. It is claimed to automatically regulate the amount of current which flows

into the battery and keeps the charging current at a steady and proper rate, regardless of the speed at which the car is run. Owing to its special form and the particular design by which a minimum amount of current is required, it is said to require only a small battery.

S. S. Eveland, the inventor, has made arrangements with the United States Light and Heating Company, of New York, and with its factory at Niagara Falls, for the manufacture of this electric self-starting and lighting device for automobiles, and this company manufactures the entire device, including storage battery.

THE EVER-READY SPRING ENGINE STARTER

Probably the first Automatic engine starter offered to the trade was the Eveready, manufactured by the American Ever-Ready Company, 304-322 Hudson Street, New York City. This starter has been on the market for a number of years and is being furnished as standard on a number of cars.



The Ever-Ready Automatic Engine Starter

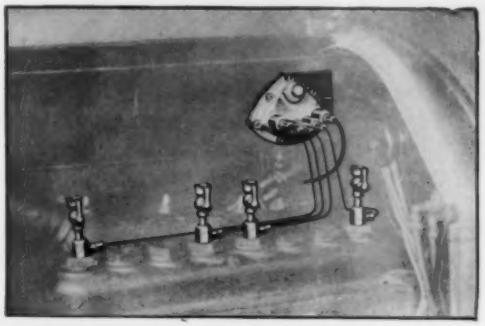
The Ever-Ready is a mechanical device of the spring type, operated by two powerful springs, which are automatically wound and then held by a brake band which, in connection with a release lever, is connected by a trip cable to a pedal on the footboard of the car. By pressing the pedal with the foot, the brake band is released, the spring unwinds and starts the motor. This device is attached to the car in place of the regular starting crank. Should defective ignition or fuel result in failure to start, the springs may be rewound with very little effort, and no danger, by means of a detachable crank furnished with the starter. When the motor starts, the springs are automatically rewound by the first twenty-six revolutions of the motor. When the springs are rewound to the proper tension the rewinding mechanism automatically disengages.

The starter is made in three sizes for motors of various horse power and sells for from $135 to $175. Its construction and operation are explained in the caption beneath the illustration.

PANWOOD ACETYLENE ENGINE STARTER

The Panwood acetylene engine starter is made by the Panwood Manufacturing Company, Grand Rapids, Mich. The device injects a small and equal amount of gas into each cylinder by a slight pressure of the foot on the push button, which is located on the dash. Upon removal of the foot the gas is automatically shut off. The gas is held outside the distributor by a needle point valve.

The first action of the foot pressure on the button causes the main check valve to open automatically and allows the gas to enter the distributor. As this action is continued the valves to the cylinders are opened in rotation, allowing an equal amount of gas to be admitted to each cylinder. Upon completion of the action by the removal of the foot, the cylinder valves and main check valves are automatically closed as before mentioned. All that remains to be done is to turn on the ignition switch and explode the charge of gas in the cylinders. The injector valves consists of threaded fittings which are screwed into the cylinder in place of priming cups.



Distributing System of the Panwood Acetylene Engine Starter; showing how the gas is taken from the gas tank into the distributor and from there sent to the various cylinders.

The Panwood outfit can be attached to any car, weighs but 6 lbs. and has few parts. The price for the four-cylinder outfit is $50 and for the six-cylinder outfit is $60.

THE ARTIZAN COMPRESSED AIR ENGINE STARTER

The Artizan Brass Company, 872 Lincoln Parkway, Chicago, Ill., is bringing out a compressed air Engine starter, which differs considerably from any other, so far brought to our notice.

The starter consists of a cylinder and piston arrangement connected with an automatic clutch, so that when air is thrown on to the piston the engine will receive an impulse which will give two or three revolutions. This cylinder is made of steel, very light, small in diameter. The air is stored in a small tank connected at some convenient part of the chassis. This tank is small in diameter and also of sufficient strength to sustain a very high pressure. The air pump that pumps the air into the tank is fastened to the chassis over the back axle of the car. Another member of the pump is fastened to the axle. By a vibration of the body of the car the pump will force air into the tank up to any pressure that the relief valve may be set at. The tank will carry sufficient volume of air to turn the engine over any number of times required.

TUDOR SPRING ENGINE STARTER

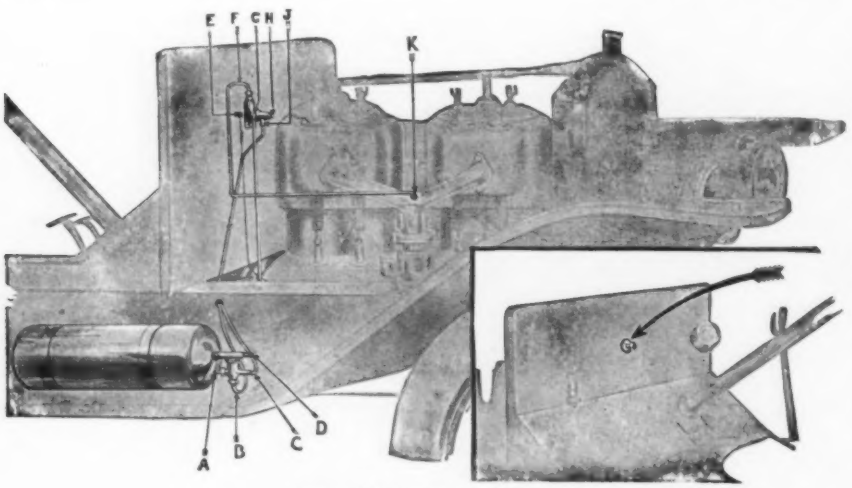
The Tudor spring engine starter is made by John W. Tudor, 35 Congress Street, Boston, Mass.

The starter operates the motor by the uncoiling of a powerful coil spring. When thrown into clutch with the engine shaft, it gives three rapid revolutions to the engine. The turns are rapid enough to start the engine readily on the magneto. The starter is thrown into clutch with the engine by pushing a food pedal from the seat. This pedal is pushed down and held long enough for complete unwinding of the spring,

which takes from two to three seconds. After the engine is running and the pedal is released, the spring will then be thrown into clutch again with the engine; this time the action is reversed and the engine rewinds the spring for the next start. The starter spring when wound is automatically disconnected from the engine. If, for any reason the engine does not start, either for lack of gas or proper sparking, there is a hand crank by which the spring can be wound up by hand. The starter is bolted to the car frame in the position of the old crank and connected directly to the crank end of the engine shaft. The operating pedal is connected with a lever on the starter, and is attached to the car frame and brought through the footboard of the automobile. The weight of the starter is about 75 lbs.; is made of the best materials; is small and compact, and takes up very little space. The size of the case is 9 x 9 x 10 in.

INVINCIBLE ACETYLENE STARTER

This starter is made by the Invincible Starter Company, 740 Penobscot Building, Detroit, Mich. It consists of a key-way controlling the flow of gas to the lamps and to the inlet manifold, copper tubes and connections for conducting the gas from the tank via the key-way to the aforementioned points and an adjustable valve which controls the air supply. The only work that is required to install this starter is to bore a ¾-in. hole through the dash and a ½-in. hole in the intake manifold.



Invincible Acetylene Starter

The Invincible Acetylene Starter showing same applied to a four-cylinder motor. The lower right-hand view shows the button, which does all the work that is required

In the cut-A is the key-way controlling the flow of gas; B is a tank union connecting tube conveying gas from the tank to starter; C is a rubber tube connecting the two-way valve with a lamp; D is the regular key-way control on gas tank; E is an insulated wire connecting the binding posts with the magneto ground terminal; F is brass tubing conducting the mixture of air and gas to the intake manifold; G is the adjustable valve which controls the air supply; H is the needle valve controlling the flow of gas from tank to starter; J is the starter union connecting tube conveying gas from tank to starter, and K is the union connecting mixture tube to intake manifold. The arrow shows the foot-operated button which automatically breaks the ground circuit and allows the mixture to flow to the intake manifold. This pushing of the button stops the motor and allows the cylinders to suck in the mixture of the acetylene and air, ready to be started on the spark. The price of the complete outfit is $25.

THE HANNA ACETYLENE STARTER

The Hanna acetylene starter is made by J. H. Valentine Company, Syracuse, N. Y. The principle of this starter is that of most other acetylene starters but the operation is somewhat different.

The gas is led from the regular acetylene lighting tank through a small tube to the operating valves which may be located at any convenient place.

The operator fills the measuring device by means of the starter valve. This charge is then forced into the cylinders of the motor by pressing down plunger of measuring device. The plunger is then pulled back and automatically fills with air. This is pushed into the cylinders in a like manner, stirring up the mixture in the cylinders and leaving nothing but pure air in the starter tubes and injectors. The motor is then started "on the spark." The whole operation can be accomplished in 8 seconds.

When the motor is accidentally stalled with the switch on, air can be injected into the cylinders and the motor started. The price is $35 complete.

THE NATIONAL PEDAL ENGINE STARTER

The National pedal engine starter is made by National Gas Engine Starter Company, 30-32 North Dearborn Street, Chicago, Ill. It is a purely mechanical starter, all running parts being fitted with ball bearings. The source of energy is derived from the pressure of the foot and should the motor back fire the device will automatically throw itself out of gear.

OTHER AUTOMATIC ENGINE STARTERS

The Home Light Company, 2108 Dayton Street, Chicago, Ill., makes a combined apparatus which starts the engine by injecting acetylene gas into the cylinders and which also controls the gas to the lamps, and lights the lamps by electricity. The gas is used from the regulation gas tank, but is introduced into the intake manifold instead of direct to the cylinders as in other devices. The price of this device is $20.

The Kimball Tire Case Company, of Council Bluffs, Ia., recently got out a new starter. This is operated from the seat. Pulling a handle on the floor board causes a clamp to grip the fly wheel and revolve it.

The Volkmar Auto Starter Company, 203 Broadway, New York City, makes an Engine Starter of spring type.

The Wilson Motor Starter Company, Franklin, Pa., is making an electric "Engine Starter," which it calls "Never Miss."

What Grocers Are Doing With Commercial Cars

(*Continued from page 16*)

know if they were being abused, and why they didn't feed them. Kind hearted women did not like to see these horses delivering to them, and inquired if there was not some other way that goods could be brought without so taxing the poor horses. Every now and then during the hot weather a horse would drop, in other words, it was taxing the system to the limit to deliver even fifteen miles from the store.

The statement was made by the head of the delivery system that "we know we could not handle our present business with horses unless relays were maintained at outlying points, and this would cost us much more than to operate trucks." He further remarked that in innumerable ways the trucks were an advantage. For instance, he says, "the other morning I heard the foreman call to the helper, 'are those crackers here yet from Ivins?' 'No.' 'Well, I have about fifteen minutes, telephone up that we will call for them with our truck.'" The truck goes up for the crackers and gets back in half to three-quarters of an hour, a trip which would have taken half a day for the horse, and upset the entire schedule, yet these little side trips which insure the goods getting to the customers are often made, and nothing is thought of them. The delivery service has often been so extended that the salesmen had to be supplied with motor cars in order to cover the enormous territory now served by the trucks. When asked for a comparison between the horses and the trucks, the statement was made that the comparison could not be given as so much territory and so much more was being done, that they could not be compared. The question was then asked as to how the cost of operating the trucks, after the company owned their own, compared with the charge made by the Service Department, and the following statement was made: "We have a maintenance contract on the present trucks, although we own them, which includes overhauling them once a month, looking over all parts, tightening and adjusting, and towing us in free from any point within twenty-five miles, for which we pay $25 per month, per car." The items on one truck for one month are:

Cost of Operating One Autocar One Month

Maintenance contract	$25.00
Garage	17.50
Gas	18.72
Driver	56.00
Boy	20.00
Oil and grease	9.14
Insurance, tags and license	18.45
Interest on investment	11.76
Anti-skid chains, sockets, etc.	7.02
Tires	28.48
Depreciation at 25 per cent.	49.00
Total	$261.07

As the cars are garaged with the wagons they are charged with their proportionate share of space according to the number of vehicles housed. The tires are guaranteed for six months, irrespective of the mileage, and the cost of tires is, therefore, taken as one-sixth of this amount. Depreciation is placed as high as 25 per cent. simply to make sure of having it large enough, and is admitted to be too high according to the performance of the machines up to the present time, but is put the same as is usually placed on horses used in heavy service. In comparison with this the Autocar Service charge for the same period for one car was $351.15, $300 being the charge for the minimum time, but the cars were used overtime to the extent of $51.15. In addition to this, the man who was learning to operate had to be paid, which amounted to $48, making $399.15, so that the company is now saving in the neighborhood of $137 per month on each truck by operating them itself, and a good deal more than this over what it would cost to do the same work with horses, if that were even possible.

(*To be continued*)

Commercial Cars in Grocery Service

Consistent Equipment, Properly Maintained, Increases Business

BY WILLIAM J. JOHNSON

Commercial cars are adapted to every use to which horses are put, with possibly a few exceptions. For the grocery trade they are especially well fitted and when installations are consistent good results are bound to follow, all things being equal. Grocery service, by reason of the many peculiar conditions surrounding it, is hard and a car in this line of work, so the grocers who have investigated the subject and tried out all types of cars, state, must be kept constantly on the move to prove a revenue getter. One of the hardest services to which horses are put is grocery delivery and there is a limit to horse capacity just as there is to anything else.

Why use horses if commercial cars will do the work better, prove more economical and satisfactory. "But will cars do all this?" a skeptic may ask. That all depends on service, the conditions under which a car must operate, number of stops on a given run and the distance on a given route from the base or store.

Consistent Installation

In all cases an installation must be consistent. A wise grocer will not use a two ton truck to haul a thousand pounds of groceries. He will investigate the subject, regard his service from every angle and purchase that car, gasoline or electric, which will best meet that service. No matter what a service may be, there is a car to fit it in the slogan of one well known manufacturer of both gas and electric types; and, such is the case for the grocer who has held off from installation because he thinks there is no car to fit his service is obviously mistaken. The idea is to convince him that he is wrong. It invariably is the case that once a grocer has used a car, be of whatsoever sort it may, one point becomes clear, and that is that he can care for more territory in less time.

Some Mistakes

There are those who have put cars in unsuitable service. This breeds discontent which is bad, to say the least. Com-

plaints that a car does not come up to expectations is due either to the driver, overloading or inconsistency in selection If a grocer's service is such that electrics best meet his needs he should not put in service cars of other types, or the other way round if gas cars are what his service requires. Such mistakes as have been made are not entirely devoid of good results. If the grocer on one corner uses cars with good results and the man on the other corner through improper selection of equipment had hard luck, he is quite certain to ascertain why his competitor "gets there" and he does not. It will not take him long to learn that he has made the mistake himself.

Prompt Delivery

Grocery delivery must be prompt and there is no reason why it should not be. The writer recently discussing service with C. F. Smith, of Detroit, who operates a chain of cash stores, was informed that low prices prevailing in the Smith stores were possible because the purchaser carried his own goods. But all purchasers will not carry their own goods even in the face of low price concession.

What it Means to the Customer

Motor delivery benefits the customers of any store. One pays the price which is based to some extent on the cost of delivery. A purchaser wants groceries at a certain time and if he lives four miles from the store or even more, he would get them sooner if delivered by car than by horses.

A Business Asset

Commercial cars are business assets to any grocer. Various grocers interviewed on the subject of delivery are frank in their statements to this effect. Because of the fact that the car can go faster and farther than the horse, the user gets into new territory, or to say the least, can take better care of those customers on the edge of his zone of delivery. It frequently happens that where customers of a firm have left the delivery sphere they have come back to the house immediately and cars were installed and could deliver to them. This point has been emphasized in the course of numerous interviews.

Caring For the Summer Resorter

The summer resorter has come to be a factor with the grocer. In some cities, as for instance in the great lakes section, there are many summer colonies remote from the city. With the commercial car it is possible to deliver direct to these customers without bothering with trolley or other express mediums, the purchaser receives his goods direct.

The same holds true with suburban trade in which the grocer usually makes two or three deliveries a week. Then too, one must buy a certain amount to have the goods delivered. Being remote from the city the suburban resident finds it to advantage to purchase in quantity. The more enterprising of the city grocers can make daily deliveries without any trouble whatever when employing cars.

Speed

A rebuilt pleasure chassis equipped with a delivery body finds favor with many grocers. This sort of car with pneumatic tires and not loaded more than would be a touring body with passengers can make good time. The writer has interviewed many grocers who use this sort of car and they state that it is because they can make speed that they are using such a type. A speed of 20 to 25 miles per hour is comparatively rapid when it comes to grocery delivery, yet it is safe and sane with the proper car.

Best in Hot Weather

Summer is hard on horses in grocery service. The best houses find it necessary to change at noon. For example a horse working in the morning it taken off the wagon at noon and rests until the next morning. If the horse works mornings one week, the next week it will be used afternoons. As has been frequently pointed out in this publication, cars are especially useful in summer. The loss of a single horse in view of the present price of animals would do a lot in operation of a car.

Best For Long Distances

Grocers who use horses and cars state that the latter are better for distances of 2½ miles upwards. Within that limit, they contend that a horse team will do the work just as well, since a stop is a stop regardless of the delivery medium. This being the case the cars are used for the longer and therefore harder work and the results obtained are very satisfactory. A horse on a twenty mile run would be fagged out at the end but the car would be still ready for business. Many have had to try cars to find this out.

Grocer Uses Trucks

Allen Slade & Company, wholesale grocers of Fall River, Mass., state as follows: "Our business is entirely the distribution of wholesale groceries in this and surrounding towns. We are now using one Knox two-ton truck in delivering wholesale groceries, also one three-ton Kelly which is perhaps used more in heavy hauling than in delivering. This work was formerly done in part by horses and in part we did not do it at all, as the suburban delivery distances now covered are prohibitive if reliance is placed on horses. We are unable to make any comparative cost of operation between machines and horses, as the work done by machines is so different and of much greater variety than anything we formerly did with horses."

EXTENSIVE GROWTH IMPOSSIBLE WITHOUT MOTOR TRUCKS

Extensive growth which has marked the business of C. F. Smith, who conducts a chain of cut price groceries at Detroit, Mich., would, it is stated, have been impossible without motor trucks. In other words, C. F. Smith could not operate the 31 stores he conducts today with more contemplated for the near future. When the first car was purchased nine stores were in operation.

No Deliveries

Delivery costs money and a good equipment is necessary. C. F. Smith does not deliver. The contention is that eliminating the delivery, letting the purchaser carry his own goods, makes possible a reduction in the selling price. That is why C. F. Smith undersells competitors. That business has been good is evident from the fact that 31 stores are now in operation.

Four Cars

With a business of this nature, obviously a base is imperative and in this service it implies a well stocked warehouse. These 31 stores are scattered all over the city of Detroit and four cars are used as feeders. Berries are in season. A carload lot or otherwise is received. Prompt delivery of perishable fruit is necessary. The cars are prompt and the berries, shortly after arrival at the storehouse or base, are delivered to the chain of stores all selling at the same price. For this service two three-ton Packards are used, a two-ton

One of the C. F. Smith Commercial Vehicles, Doing Good Service in Grocery Business

and a one-ton G. M. C. The first car was acquired nearly two years ago, hence rapid expansion of the concern is apparent. It is stated that horses are out of question for the service. There were nine stores only in the horse days. Cost of operation is said to be about $9 a day for the smaller cars and from $15 to $18 for the larger, these figures taking into consideration all items.

A SURPRISE

There is much in demonstrating the worth of any given commodity or unit to those who are inclined to be skeptical. To state that a definite performance is possible with a given car is not always believed by the prospective customer. He must prove it for himself. Now, as a rule, these conservatives, once they become fully convinced of the efficiency of motor delivery, become enthusiasts.

August Miller, of the firm of Miller and Son, grocers, Detroit, Mich., is regarded as an enthusiast. Mr. Miller was real busy on the berry question when the representative of the COMMERCIAL CAR JOURNAL called to interview. To cram

A Warner Four-Cylinder Car in Service of Miller & Son

that whole interview into a few words, the statement of Mr. Miller tells the story. "I wonder how I ever got along without it," speaking of a four cylinder Warren delivery car of 1000 lbs. capacity, which he compared with an up-to-date electrically driven coffee mill, a fixture he would not possibly do without today. He had to grow up to that coffee mill, not because he could not afford it, but because he did not realize the need of it. So with the car. "The automobile," he says, "is the coming thing, they can all say what they will."

There are two cars in the Miller service and one of them has proved more or less troublesome, the other very satisfactory. Three horses were disposed of when the cars were acquired and the firm can now consistently care for remote, select trade with the car and that spells increased business. Horses could not do the same work in the same time and could not cover the same territory. Just how the car is loaded is evident from the illustration.

HORSE TAKES YEAR VACATION WHILE BRUSH DELIVERY CAR BUILDS UP BUSINESS

Had not William A. Collin's horse stepped on a rusty nail, become disabled and forced to take a year's vacation necessitating purchase of a Brush delivery wagon, William A. Collin would not be doing the business he is today. He is engaged in the sale of butter, eggs, tea and coffee, and his territory is Detroit, Mich.

A year ago last Easter the horse became disabled and another could not be secured, so that purchase of the Brush was imperative, that is the purchase of some car was, and the owner is satisfied with his choice. While the faithful horse of limited capacity was taking his vacation the little car was proving to the owner that he could cover a lot more ground. He now has 300 customers and his week's work is all mapped out for certain territory each day, the city covered in the course of a week. Customers who have removed to

Delivery Car That Has Taken Place of Horse on Vacation and Built up Business

more remote sections are now back on Collin's books. With the horse that would be out of the question.

The original set of pneumatic tires is still in service, having been retreaded. The car does business every day, has never been tied up and some days covers 50 miles. The day's work begins at 8. A. M., the route is covered and the owner at home by 3; impossible with a horse. Repairs have been slight. William A. Collin has tried out the little car for over a year and he would not go back to horses. He could not do so and run the business alone. That's another feature of car delivery for the small dealer. He runs the business himself, as he wants to and when he wants to. Mr. Collin lays especial stress upon this point. The horse has been disabled and is only now in condition to be sold. He has had to be fed during a year of illness.

MOTOR DELIVERIES BRING BACK OLD CUSTOMERS

Motor deliveries have been the direct cause of the return of many of the oldest and best customers of C. N. Dodge, a Hartford, Conn., grocer who is using a four-cylinder pleasure chassis fitted with a light open delivery body. These customers have "come back" because the grocer is now able to attend to their orders. They had removed from the Dodge zone of horse activities, that is to say they could not be served by the horse delivery. They were too far from the Dodge headquarters to make it worth while for either party. But the motor delivery alters the situation and is it any wonder then that "Dodge the grocer" is very enthusiastic over his service?

Our representative had a very interesting interview with C. N. Dodge, in fact, several interviews. Here is a man who realizes the value of motor delivery. He was very willing to talk about his service, to tell the whole story and to inquire from the interviewer on various phases of commercial delivery. Then too, he knows just what his service costs him. When the interviewer inquired as to cost the grocer smiled and remarked that it did come "rather high," but in consideration of the peculiar features of his service it was "worth the price." That was an intelligent reply and made with a full knowledge of details.

"Are you satisfied with your service?" was asked by our representative. C. N. Dodge smiled and remarked that he was and that he had done some wonderful work with the car.

His own story of the service follows:

"I am using a four-cylinder, make and break, Columbia pleasure car fitted with a delivery wagon body. The car was used three years previous to 1907 as a pleasure vehicle. I used it two years as a pleasure car and it has since been run 15,000 miles as a commercial vehicle. As to distance covered the car travels about 1,000 miles every three weeks and makes no short stops, that is, the deliveries commence some distance from the store. This saves time as it leaves the horse equipment for work closer to the store. There are two men on the car so that parcels are delivered in quick time. During the holidays of 1911 this car did as much as four teams could have done and has always been ready for business. Our heaviest day is Saturday. The smallest run made is about 45 miles a day.

"One good feature of the motor delivery is that I have reclaimed many of my old customers who have removed from my district, that is farther out than I could conveniently reach with horse teams which would take a lot of time anyway.

"'How long do I figure that car will last?' Well, the first year I marked off $600 as depreciation. As for life I estimate that two hard winters which the vehicle has actually withstood are equal to three summers. The life of the car I set down as a year and one half."

"'What does the service cost?' During cold weather I have to figure on $5 a month for garaging, this for four months. During the warmer months the car is stored in our barn. For tires, which come rather high, I allow $2 a day. For a period of 13 months it cost me $1475 to keep the car on the road. I had to have a new carburetor and that came high and the mechanic managed to run up a bill of $30 for attaching it. To this item of $1475 for repairs must be added $626 for tires which, with garaging, makes a total of $2121 for the period referred to, or approximately $163 a month. For the load carried, which is not over 1000 lbs., this would strike many as expensive, but a point to consider is that once a grocer who has a lot of deliveries to make, uses the up-to-date method he cannot get along without it, so I have kept paying the bills, for it would require four teams to do the same work, which means at least four more horses and three more men to drive. Yes, all things considered, the service is very satisfactory."

When asked as to whether or not he considered the installation consistent, the owner replied that it did the work but strictly speaking from the viewpoint of the truck engineer, it would not be regarded as consistent.

"To begin with the car was only an experiment but I could not do without it now."

"Has it been the means of increasing business other than the reclaiming of your old customers who had moved out of your district?"

"Yes it has, I have had people come into the store and remark that as long as I was making deliveries in certain remote sections with the car that they would like to be accommodated."

"Do you overload the car?"

"Yes, in fact the first trip this morning was about 2500 lbs., which goes to Wethersfield prison. The institution is three miles distant. The car leaves here at 8 o'clock in the morning and is being unloaded at the prison ten minutes later. By using the car I am able to take good care of institution orders. The load this morning represented $125.

"When you speak of cost of service you must remember that it would cost me $100 a month to feed the four horses alone, these necessary to replace the car, shoeing would bring the figures up to $150, not to mention the extra drivers.

"We are making trips with this car which would be almost impossible with teams because of the distance. At 8 o'clock in the morning the car leaves for Wethersfield, a good six mile round trip. At 10.30 o'clock it leaves for Cedar Mountain section, another six-mile round trip at the least. At 11.15 o'clock it goes south and makes a round trip of six miles, not to mention two trips out Albany Avenue and the Hill district.

"Bear in mind that horse teams must leave the store at 9.30 o'clock or 10 o'clock to make deliveries in time for dinner. With the car, however, we can leave at 11 o'clock or even 11.30 o'clock and have everything on time.

"Yes, we occasionally break a spring and have it replaced. I figure that it is cheaper to break a spring now and then than to use solid tires and wreck the engine. What do the makers of the car think of my proposition? They did not favor it by any means. They contend that it is all wrong, but results count. I know to a cent just what the car costs me. I know that it has increased trade, that it has brought back customers removed from my district, so I consider it well worth while. I should like to operate the vehicle at much less cost, but equivalent horse service would cost about as much and could not make the time."

ELIMINATES THE JUMPER

Some grocers have two men on a car, a driver and a jumper, so called, who assists in deliveries. A middle western grocery house has done away with jumpers, as it was found that the drivers, who were paid $16 a week, usually occupied the seat and leisurely smoked while the jumper, an assistant to the driver, who was paid $6 a week, did all the hustling. The firm's idea was that both driver and jumper would dispose of the load, and by working in unison, would perform the task just that much quicker. Now, in this service, the driver must do it all. The scheme as noted above proved very bad for the house, as in the event of a complaint by a customer, the boy or jumper was left to arbitrate, to which he was hardly equal. The change has proved satisfactory.

A REMARKABLE DEMONSTRATION

It is a well known fact that even those who ought not to occasionally overload their trucks, this is especially true when a demonstration is being made to show the possibilities of motor delivery. Undoubtedly the most phenomenal performance yet recorded for a motor truck is that recently "pulled-off," to use the trade verancular, by the Steckel Motor Truck Company, 1414 Ridge Avenue, Philadelphia, with a 3½ ton B. O. E. truck.

As a demonstration of the possibilities of this husky 3½ tonner, a load of sugar consigned to Witman-Schwartz Company, of Harrisburg, and consisting of 15 barrels, of 400 lbs. each, or 6000 lbs., 50 cases of 140 lbs. each, or 7000 lbs., and 75 bags, of 100 lbs. each, or 7500 lbs., making a total of 20,500 lbs., or 10 tons 500 lbs., was placed on the 3½ ton truck. In addition to this an ordinary horse wagon was attached at the rear and loaded with 2 tons, which together with its own weight made a load of 3½ tons as a trailer. The truck itself weighs 8640 lbs., so that the total load to be moved by the engine was 17½ tons, while the net load on the vehicles was

B. O. E. Three and a Half Ton Truck Hauling Over Twelve Tons Between Philadelphia and Harrisburg, Pa.

over 12 tons, not counting in about a 1000 lbs. of lumber jacks, etc., for strengthening bridges en route. This tremendous load was handled by the truck without a murmur, not only the entire distance from Philadelphia to Harrisburg, but even negotiating without trouble the famous Skipback Hill. Demonstrations were made at all the points along the road and in Harrisburg, the load remaining on the truck for 12 days.

It is claimed the motor in this truck will pull this load at 600 revolutions, and that an inspection of the springs at the end of the trip revealed no permanent set.

A REMARKABLE MOVING WITH A SEQUEL

A moving feat was recently performed in Philadelphia which before the advent of the motor truck would have been impossible. The Accident Insurance Company's office equipment occupying a six-story building, at 4th and Walnut Streets, Philadelphia, was moved to New York City by the Guarantee Storage Company, 1317 Brown Street, Philadelphia, in record time.

The contract stipulated that the moving should begin on Saturday and that every thing should be in place in New York on the following Monday morning before 9 o'clock, there being a penalty of $100 for every hour delay after that time.

In order to accomplish this feat the Guarantee Storage Company brought into use its force of Mack trucks, in addition to using a special freight train from Philadelphia to Jersey City and special floats from Jersey City to New York. The most important pieces were loaded on the trucks and taken directly to New York and delivered at the new offices. These trucks then returned to the ferry and received the train load of goods from the freight cars and delivered same in short order.

On Monday morning before 9 o'clock every piece of furniture was in its place, the ink wells filled and every thing in the usual running order. In fact it is said that four policies were written by 9.15 in the new offices.

This moving demonstrated so clearly to the Guarantee Storage Company the great advantages of motor trucks over horses, that they decided to do away with all horse equipment, and in the Philadelphia papers the next day could be seen their advertisement.—"All horse drawn vans and equipment are for sale cheap by the Guarantee Storage Company."

"DEMONSTRATIONS"*

ITH the introduction of any new method, system or device, it has generally been found necessary to show or prove in some practical manner the feasibility or working of the idea, and this necessity is likely to increase with the price of the commodity. With expansion and time, however, the necessity for continuing to follow the practice of the "man from Missouri" diminishes, until at last the proposition is accepted by all as being thoroughly practical and accepted as a matter of course. Now just how far we in the motor truck industry have advanced toward this desired goal is a question; certainly there is no longer the necessity to do what we had to in every case back in 1906 and 1907. From an infant in 1906, the commercial motor vehicle industry has grown till now it is a good-sized youngster, and the number of vehicles in use in this country exceeds thirty thousand; —there is hardly a line of business where motor trucks can be used that we do not find them, nor even a town where they have not been seen upon the street.

The parade this Club held on April 13th, just passed, covered over three miles in length and included over five hundred machines. Are not these facts which are known to all buyers sufficient cause for us in the business to eliminate a portion of our demonstrations? The buying public must be willing to take for granted that trucks must be of value, economic or otherwise, when they read and see every day, new installations, some of them often wiping out entirely the old horse equipments. This being so why do we not cease to cater to the purchasers' curiosity or cupidity and argue the merits of our machines, our companies and our facilities for taking care of the interests of our customers; these it strikes me are the sales factors; not doing what every one of five thousand trucks are doing daily in New York, Broadway between the hours of nine and six should be demonstration conclusive that no one need fear purchasing machines; there are two trucks every minute and a half passing, and some of these date back many years.

The ever-changing condition in the sales offices along automobile row has some effect upon the demonstration situation; every month or two a new face appears and it is but natural for the newcomer in the business to feel that upon his shoulders rests a great deal of necessary "show me" work. Possibly his machine is new to the industry or locality and there again in his incentive to plead for an opportunity to haul goods. While all this is so to some extent, I believe that the newcomer can safely take advantage of the pioneer work, but there is no reason why new machines should not prove of as much value as those which have passed through years of service, if the designing engineer has taken advantage of the experience of others; age alone is not the main reason for influencing a purchase; some of the older companies are producing nothing to-day which represents a great improvement over their early models and a number of new trucks would be among the "season's best sellers" if the manufacturers appreciated the wide distinction between the automobile and motor truck business and employed men accordingly—passenger car salesmen have not proved themselves in the commercial field any more than the truck man could be expected to make a reputation in the other line, and this truism holds good from the sales end back through to the factory. That newness of a product should offer no great detriment toward sales I can argue, as there are few indeed among users who know even a small percentage of the machines manufactured and whether yours happens to be new or old therefore is a secret; I can probably mention fifty or more trucks dating back five or six years that were never heard of in this section; probably many of them strangers to you fellow-club members, yet these trucks are doing good work and should require no demonstration if marketed here, unless the representatives personally felt the necessity of doing so. Now, this brings me to a point that I wish to particularly emphasize. Is not the faith of the particular truck representative, or rather the lack of faith—the great cause of much of the unlimited demonstration work now going on?. If we ourselves really believed in the machines as strongly as we claim, would we not then so impress our prospective purchasers with such belief as to not necessitate demonstrations. I become more and more convinced that the man who masters his machine, absorbs the ideals of the factory, and can see the hundred and one possibilities for application, can to a large extent travel free of demonstration trucks.

Now, while I am not a great believer in demonstrations, I think that it is often a very excellent thing to run a truck about and show it, and in this work I wish to make a distinction from demonstration work. Often a merchant is too busy or at first indifferent to call at the truck sales room to inspect the vehicle; the next best thing to do is to then take the machine to him. In this manner an inspection may be made or some enthusiasm aroused, and the path toward the goal of the signed order made easier. Often during such inspection tours, it may be thought advisable to possibly take a load or two for the merchant but this does not in my mind come under the head of demonstration work. Under certain circumstances, I believe that demonstrations are advisable and necessary and should be given to determine. First, if capable of being maneuvered readily at loading or discharging point, or through narrow streets; second, if capable of being fitted with a certain type or size body; third, if capable of hauling its load up exceptional grades or over road conditions of a trying nature; fourth, to determine whether or no the delay at ferries or docks or other terminals is so great as to offset the truck's advantages; fifth, to determine whether or no the spring action is not too severe for the character of the load to be hauled; sixth, in laying out new work for the truck, where

*Extracts from a paper read before the Motor Truck Club at the June, 1912, meeting by Charles E. Stone.

AVERY COMPANY
DES MOINES, IOWA
W. D. CRAWFORD, MGR.
AVERY

ROBERTSON & BENNETT
KEENE, N. H.
G. B. ROBERTSON,
F. J. BENNETT, PROPS.
REO

CURTIS AUTOMOBILE CO.
MILWAUKEE, WIS.
HARRY LANDAUER, PRES.
F. O. OLSON, SEC'Y & TREAS.
REO

such work has never before been attempted, to determine the possibilities.

Under no circumstance should long demonstrations be granted. Let us regulate to the scrap heap for all times the old idea of a month or even a week; a day or two is quite enough to definitely determine anything we wish to bring forward and the rest a matter, largely of mathematics. The old view that a demonstration would indicate the operating cost of motor trucks has long since been exploded, the only thing it shows is the ease with which the machine can be operated, power and spring action —absolutely nothing else. The majority of demonstrations as given to-day could be more economically and quickly made with a pencil and paper; given the character, size and quantity of the material to be carried, the distances and roads over which it must go, the number of stops to be made and it then becomes a simple problem in addition, division and multiplication to very accurately determine the cost per ton or package, for we know from experience the life of the various members, the speed under all conditions, the carrying capacity, etc., necessary to estimate the cost of every factor entering into the operating expense of the vehicle. In many instances our habit of demonstrating, particularly where we afterward render itemized accounts, leads to trouble, as the merchant in place of viewing the performance of the truck as a whole, simply selects one or two items, probably ones which have no bearing upon the real value of the machine, and compares these items one with another, on each report. Of what use, for instance, is it to compare the speed made by different trucks up a certain hill, or the one item of oil, or gasoline, or grease; an ungoverned motor might win in such competition, but in the long run prove extremely expensive; another motor might use more oil, but far less gas or its tire expense be less than another. Much care must be exercised in making reports and no demonstration should be forced upon the prospect; having made up one's mind to grant a trial, every firm should see to it that the truck appointed for the work is right in every detail; there should absolutely be nothing the matter with it to cause the salesman to apologize or explain; how often have I had to state that the governor was not working on this truck, or that we were hard pressed for a spare machine and had to take this old thing which needed overhauling. Excuses for a manufacturer's demonstrator do not go. You may think you can get away with it, but there is always some impression left in the mind of the prospective buyer which may have an undesirable effect, and in these days of strenuous sales work, no one can afford to take a chance.

The demonstrating driver should likewise be capable of operating the truck as an expert. Motors should be started without the mighty roar we so frequently hear and when the gears are shifted, the fact should hardly be apparent as far as sound is concerned; no matter how experienced, the operator should always endeavor to make the prospective purchaser believe that it is the truck and not the driver who is performing miracles. While as before stated, it is very often advisable to demonstrate in order to ascertain certain facts, the majority of demonstrations are given without regard to the necessity for same or are demanded by the customer, and the adoption of a reasonable charge for work performed by the truck is but a just one. I have watched with interest one concern in this city which will not so much as give one day free and they have lost no business by such a method; I believe it has saved them a large amount of money and their firm stand has only served to establish itself on a better footing with those whose business they have solicited; to my mind, if every Club member put into operation some slight modification of this company's attitude on the demonstration question it would result in immense benefit to all; but it is essential that all should do it—not a few.

ITEMS OF INTEREST

Major Shaw, Nashua, N. H., agent for the I. H. C. delivery car, has secured quarters with the City Garage Co.

The Motor Truck Company, of Washington, D. C., has secured agency for Atterbury and Hatfield trucks.

Harry J. Stout & Son, of Trenton, N. J., have taken the agency for the Lippard-Stewart trucks.

The Rassel Motor Car Company, of Toledo, O., has changed its name to the Toledo Motor Truck Company.

Chapman-Love Company, Washington, D. C., are agents for Kohler commercial cars.

Clayton Machine Works, Lee Summit, Mo., agents for the Flanders delivery cars, are building an addition to their garage.

Maurer & Miller, Fort Wayne, Ind., agents for Reo trucks, have moved into a new garage at No. 17 Stevenson Street.

Skubal & Schaner, 204 Beecher Street, Milwaukee, Wis., have acquired the agency of General Motors Truck Company.

The Magna Auto Company, of Division and Railroad Street, Holyoke, Mass., has taken on the agency for Adams Trucks at that point.

Taylor, Davis & Nininger, 527 Jackson St., Topeka, Kan., have established a special garage for electric cars and have a repair shop in connection therewith.

C. L. Herring, Des Moines, Ia., distributor of Ford delivery and pleasure cars, will erect a three-story garage and service station on W. 10th St., at a cost of $50,000.

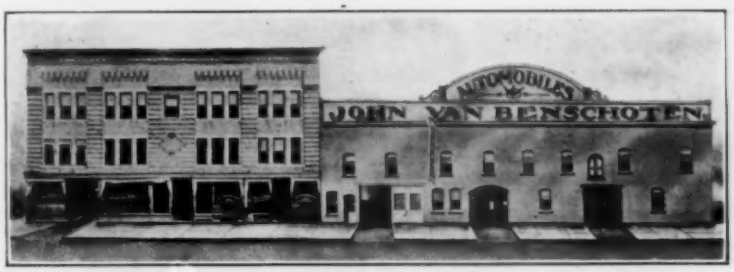
Hannon & Henry Motor Car Company, Ogdensburg, N. Y., are erecting a three story garage, 65 x 200 ft. to replace their old building which was recently burnt down.

Knickerbocker Motor Sales Company has been incorporated with $10,000 capital to take charge of the sales end of the Knickerbocker commercial cars in New York City.

Genge Power Vehicle Company, St. Paul, Minn., has been succeeded as agents for the Grabowsky truck by the Motor Truck Company. S. L. Buchanan and T. D. Lovering are the proprietors.

E. H. Bush, Springfield O., has been succeeded by Bush & Holland, who have taken over his carriage and wagon repair shop on S. Fountain Avenue, and secured the agency for the Detroit Motor Wagon.

Waverley Electric Vehicle Company, Minneapolis, Minn., has been formed to handle the Waverley electric pleasure and commercial cars in Minneapolis, Minn. Temporary quarters have been secured at 1526 Hennepin Avenue.



JOHN Van BENSCHOTEN
Poughkeepsie, N. Y.
MACK, SAURER, HEWITT,
MAIS and FORD

WESTCOTT GARAGE CO.
Utica, N. Y.
A. H. Westcott, Pres.
W. B. Westcott, Sec'y & Treas.
GRAMM

INFORMATION BUREAU

WHAT WOULD YOU LIKE TO KNOW? FREE SERVICE

There are many important questions about commercial cars, or their use or care, upon which we feel sure our readers would like to be more fully advised.

Our Information Bureau will promptly reply to all such inquiries.

Write us stating fully what you want to know.

Address

Information Bureau,
COMMERCIAL CAR JOURNAL,
Market & 49th Sts., Philadelphia, Pa.

CONVERTING A STEAMER INTO AN ELECTRIC TRUCK

[216] We recently purchased, at a bargain, a second hand, four-passenger White steamer and are seriously considering the advisability of converting same into an electric truck. The machine has wheel base of 102 in. We would be very glad to have your opinion on the wisdom of such a move. We operate a machine shop and can install the equipment at practically no cost, and the machine to be used will require a new engine and boiler, and we believe that we can purchase the motor and necessary batteries and other equipment at about the same cost that we would have to pay for the boiler and engine.

If you deem it advisable to convert the machine into an electric, kindly advise what equipment will be necessary to make the change, and in your opinion the best motors and storage batteries to install. We figure that we will require about 40 h. p. We use electric power in our shop, securing a 3 cent rate against 15 cents a gallon for gasoline, and we figure that the saving in the cost of operating will offset the difference in price of installing an electric plant.

LITTLE ROCK, ARK. MANUFACTURER.

We are rather against advising anyone to try adapting a vehicle designed for another purpose to commercial requirements; the results in the majority of instances have been anything but satisfactory. Factors to be considered in making the change you contemplate will be the character of the work, condition of roads and length of hauls, as these directly effect the radius of action per battery charge. The converted machine will not have a carrying capacity exceeding 1500 lbs., possibly one ton as an outside limit, and with this load you may expect to get not more than 40-45 miles under good road conditions. It is true that electric trucks of this rating average much higher than this, but you must consider the fact that these vehicles have been designed for the purpose in mind and can not be compared with rebuilt machines. In making the change of power, you will probably find that the electric battery, motor, etc., will weigh more than the boiler and engine formerly used and the frame will require a truss rod on each side.

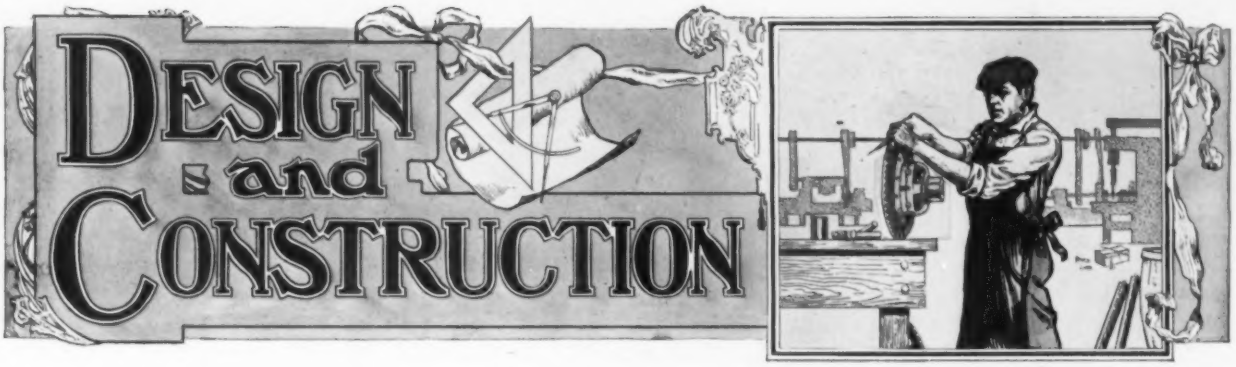
We do not know the method of final drive now used on the car, and this may have to be changed completely, in which case the cost will be increased considerably. We would suggest that before taking action, you communicate direct with the Westinghouse Electric & Manufacturing Company, East Pittsburg, Pa., with full details of the machine you have and they will then be in a position to tell you what type and size of motor and battery to use. The Gould Storage Battery Company, 341 Fifth Avenue, New York, and the Philadelphia Storage Battery Company, Philadelphia, Pa., will also furnish you with complete data on this subject.—EDITOR.

TIRE GRIPS WANTED

[217] Please inform us by return mail the name of the maunfacturer of the best mud chains, or give any information you may have regarding same to be used on a G. M. C. two-ton truck.

R. E. STONE COMPANY, McKeesport, Pa.

A very excellent tire grip for solid motor truck tires is made by the Lyon Non-Skid Company, Philadelphia, Pa., and by the Atlas Chain Company, Bush Terminal No. 4, Brooklyn, N. Y., as advertised on page 76 of our May 15th issue. Another device is being produced by the Post Tire Armor Company, P. O. Box 309, Cleveland, O. In using any form of attachment to increase the traction of truck driving wheels, the driver should be instructed to see that they are removed from the wheels when not absolutely necessary, as the life of rubber tires is not increased by skid-chains in any form, and the chains themselves suffer.—EDITOR.



Power Transmission in Electric Commercial Vehicles

BY LOUIS RUTHENBURG

ANY contention that close parallels might be drawn between electric pleasure car and commercial truck practice is set at naught by the fact that pleasure car parts are almost invariably insulated from road shocks by either pneumatic or cushion tires, which insulation permits of construction that might prove entirely impractical in connection with solid tires.

Efficiency of transmission is of vastly greater importance in the case of the electric than in that of the gas car. In the latter, considerations of engine and change gear location are of greater moment than a slightly reduced transmission efficiency; and, the mileage radius being limited only by the supply of fuel which is readily renewable, designers are fully justified in adopting constructive features which would be very questionable, indeed, as applied to an electric truck in which mileage radius depends directly upon transmission efficiency; and in which motor location (on account of the inherent compactness and simplicity of this part) is of minor importance.

A chain of either the inverted tooth type or roller type serves to transmit power from the motor to a countershaft, from the outer ends of which roller chains are utilized to convey the driving effort to sprockets mounted on the rear wheels. The primary chain is enclosed in an oil tight case or is simply protected from dust by an extension of the battery box. The former construction is preferable in that the life of the chain may be increased to a remarkable extent by the better means afforded for lubrication.

The disadvantages of the construction shown in Fig. 1 arise from a loss in mechanical efficiency, the fact being generally accepted among engineers that a bevel gear pair under the best conditions of design, material, workmanship and operation will seldom show better than 85 per cent. efficiency, whereas chains of the inverted tooth type show above 95 per cent. mechanical efficiency under rather adverse conditions. The use of a flexible shaft gives rise to further slight efficiency loss. Noise is a somewhat secondary consideration in commercial vehicle practice, but other things being equal, the more silent machine will be given preference. Bevel gears are inherent noise producers, while the inverted tooth chain is notable for its silent operation.

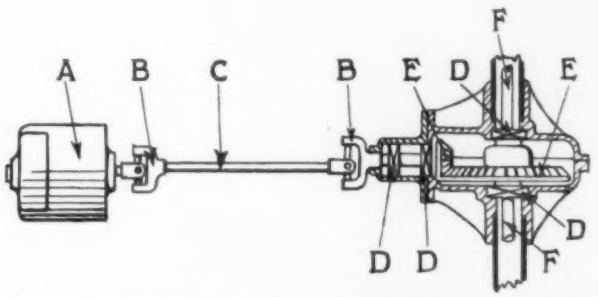


Fig. 1. A, motor; B, B, universal joints; D, D, D, D, bearings; E, bevel pinion; E¹, bevel gear; F, F, countershaft spindles

The substitution of a worm and gear for the bevel set as above described, has been proposed, and would seem to offer the advantages of noise reduction and the possibility of a

WHITE MOTOR COMPANY
NEW HAVEN, CONN.
WHITE, REO

PEERLESS MOTOR CAR COMPANY
NEWARK, N. J.
PEERLESS

BUICK AUTOMOBILE COMPANY
DALLAS, TEX.
BUICK

greater ratio of speed reduction for a given diameter of gear housing.

Live-Axle Systems

For present purposes a live axle will be defined as one in which the differential gear forms part of the axle assembly. In general, it may be said of live axle systems as applied to commercial car practice that they make for few parts, neat appearance, ready enclosure of parts requiring lubrication and for silent operation.

Mechanically, it is very efficient. The chains provide a desirable flexibility. All parts of the mechanism requiring maintenance of alignment have the benefit of spring suspension. The motor is well protected and quite as accessible as need be. All components of the mechanism have been well tried in various fields and are calculated to give sustained efficiency with minimum attention in hard service. The only criticism that

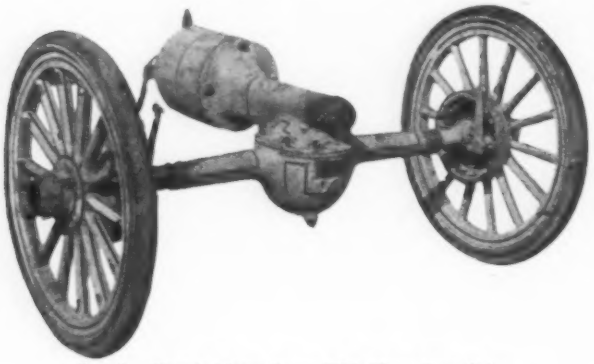


Fig. 2. Electric Motor Power With Worm-Gear Drive

may be legitimately offered against this construction is that applying to the side chains, which give rise to noise, require more or less attention for cleaning and lubrication, and usually wear rapidly.

Several designs have recently been brought forward, very similar to the one just described, but in which a bevel gear pair is substituted for the primary chain and sprockets.

This construction is diagramatically illustrated in Fig. 1. It will be seen that the motor is placed with its axis in a longitudinal position in reference to the chassis, a universally jointed shaft or its equivalent serving to transmit power from motor to countershaft.

The bevel and shaft design embodies fewer parts than that comprising chain and sprockets (in view of the component parts of the chain) and is more readily assembled from stock parts at present on the market. It is possible by this construction to so locate the motor as to enhance its accessibility. For a given reduction ratio the parts may be made somewhat more compact than by the use of a chain and sprockets for effecting the primary reduction.

The total number of parts employed is perhaps less than may be found in connection with many other systems used in this country. The great reduction effected in one bevel set, however, is not conducive to high mechanical efficiency. The motor is subjected to more vibration than would result if it were carried wholly upon the car frame, and it would seem a difficult matter to maintain the gear and pinion in proper pitch relation, particularly under conditions of severe overload. Obviously, any departure from pitch contact would result in loss of efficiency and noise.

A construction is borrowed directly from pleasure car practice. In this instance the primary reduction is effected by a silent chain connecting the motor with a countershaft. From the countershaft power is transmitted to a bevel gear

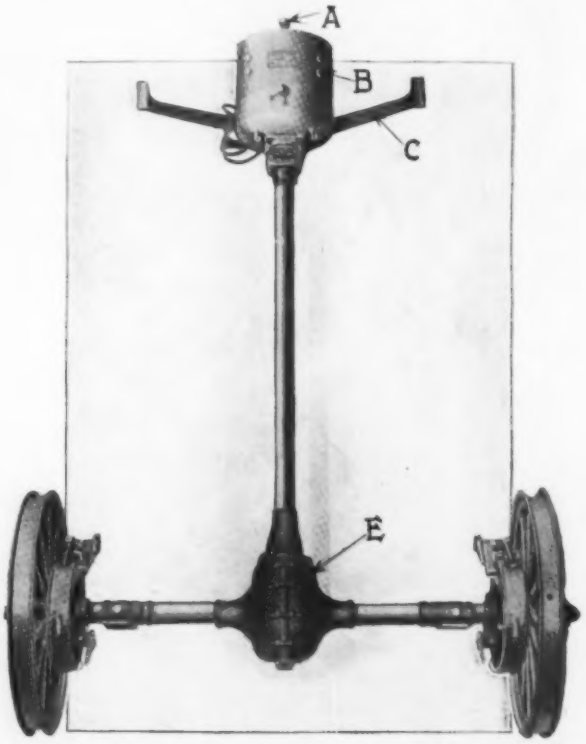


Fig. 3. A, Motor shaft, which drives countershaft by means of silent chain; B, Motor; C, trunnion, which supports motor and countershaft by means of a ball joint; D, tube inclosing propeller shaft; E, Bevel-Gear Housing.

axle of usual construction. This affords a silent, clean-cut assembly, and should afford satisfactory results if mounted on pneumatic or cushion tires and operated under pleasure car conditions. But the operating conditions to which pleasure and commercial vehicles are subjected, parallel each other so seldom that, in the opinion of the writer, it is doubtful if the construction outlined above will find permanent application in the field of the electric commercial wagon.

The worm gear layout illustrated by Fig. 2 has advantages of clean cut appearance and compactness, few parts, good lubricating facilities, fair mechanical efficiency and extremely quiet operation. The motor is subjected to more or less severe road vibration on account of its partial support by the axle. The axle housing in connection with this construction must necessarily be very rigid in order to maintain alignment of parts and excessive unsprung weight often results.

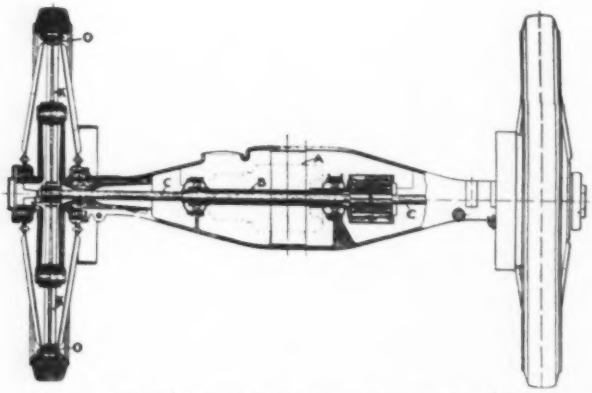


Fig. 4. Sectional View of Whole Rear Axle Assembly of System in Which Motor, Differential and Transmission Members Are all Embodied as Parts of the Rear Axle and Wheel Assembly. A, armature; B, hollow armature shaft; C, C, axle spindles; J, spur pinion; K, K, intermediate gears; O, O, internal gear ring.

A layout which is perhaps capable of greater mechanical efficiency than any of the live axle systems previously described is shown in Fig. 3. A chain of the inverted tooth type effects the primary reduction to a short, rigid countershaft from which power is transmitted through a universally jointed shaft to a herringbone pinion meshing with a gear upon the differential. The motor has full benefit of spring suspension, and the only criticisms to be offered are those applying to live-axle systems in general, and that arising from high shaft losses due to the short distance between universal joints.

A system in which motor, differential and transmission members are all embodied as parts of the rear axle and wheel assembly is shown in Fig. 4. It will be observed that the armature shaft is tubular and is extended to join the differential housing which consequently revolves with the armature of the motor. From the side-gears of the differential power is conveyed by two shafts to spine pinions in the center of the steel disc wheels. The discs of the wheels serve to house intermediate spur gears which mesh with internal gear rings forming the interior of the wheel rims. Certainly this forms a neat, compact assembly—all parts being effectively enclosed and as accessible as need be. Mechanical efficiency is high so long as all parts are maintained in proper alignment. The extra weight of the necessarily heavy axle housing is partially offset by the light differential gear and shafts, which revolve at armature speed, and may, therefore, be of small size. No member in the entire system, however, receives insulation from road vibration except through the solid tires. Field and armature windings, brushes and brush holders, differential gears, shafts, reduction gears and bearings carrying these members are all subjected to road shocks without intervention of the cushioning effect of the vehicle springs. As near the road surface as it may be placed is the internal gear-ring which forms the final member in the transmissive system. It is quite apparent that a very slight deflection of this gear ring from its original circular form would play havoc with efficiency. It would seem an extremely difficult matter to properly lubricate all parts of this assembly without subjecting the motor parts to the action of the oil. A minor criticism has been offered against this system on account of the appearance of the wheels, which, due to their disc construction, lend the truck a deceptive appearance of bulk and weight.

Wheel Systems

As distinguished from the two classes of electric car transmission practice previously reviewed, we find constructions in which a motor drives each wheel separately, and forms a more or less self-contained unit therewith.

In this construction again the disc wheel is utilized to protect the parts. A motor is anchored in the center of the wheel, with its shaft at a few degrees from right angle relationship to wheel axis. Each end of the armature shaft terminates in a bevel pinion. Each of the two discs, of which the wheel is built up, carries a bevel gear ring near its periphery and one of the pinions meshes with one of these while the other drives the opposite ring.

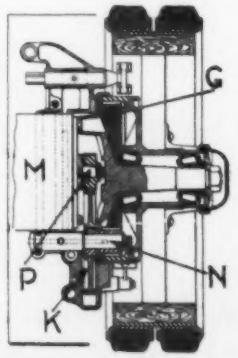


Fig. 5. Spur-Gear Drive. M, motor; P, motor pinion; G, spur gear; N, spur pinion; K, internal gear.

Thrust stresses arising from the one bevel set are balanced by the other. A small number of parts make up the complete assembly. The arrangement lends itself to four-wheel drive and steering, which features are often required in special applications. On account of balanced thrusts, rigidity of the armature shaft carrying the bevel pinions, and the few bearings, this assembly is capable of good mechanical efficiency so long as the gears retain their proper form and alignment.

It is quite patent, though, that the parts are subjected to very direct shocks arising from road vibration, and this condition gives rise to some doubt as to whether alignment and shape may be permanently maintained in the gears. Lubrication of the gears would seem to mean unnecessary lubrication

for the motor parts in spite of the tendency of centrifugal action to retain the lubricant at the wheel periphery. Limitations of space might also tempt the designer to reduce the size of his motor to the point of overloading his windings under severe conditions at haulage.

A second wheel system obviates the use of bevel gears and embodies a double spur-gear reduction (Fig. 5). The motor, of standard size and construction, is mounted with its axis in line with that of the wheel spindle. A spur pinion keyed to the armature shaft meshes with the spur gear carried by a side shaft, which in turn transmits power to the wheel through a pinion and internal gear ring as shown, the gear ring forming an extension of the wheel hub.

TRAILERS FOR LONG HAULS

For long hauls of furniture and the like, trailers are used to good advantage by the Leonard Reliable Storage Company, Detroit, Mich., one of the largest concerns in this line of business in the middle west. The tractors are three-ton trucks, which have been in service for some time. The Leonard service, aside from the trailers, which are recent innovations, has been fully described in the COMMERCIAL CAR JOURNAL. The Leonard Company, by the way, was among the first to employ the so-called loading nest or removable crate.

Big Suburban Trade

The company does a big suburban business, and from experience it was deemed wise to add the trailers. Some time ago Manager Leonard stated that he intended to use trailers, as he was sure they could be used to advantage. Now that they have been in service for some time there is every reason on the part of the management to believe that they will meet the necessity for increased carrying capacity under the old power conditions to the best advantage. The Leonard Company commercial cars travel all over the state of Michigan, and it is by no means unusual to see them 30 or 40 miles out from Detroit.

Light Construction

The loading nests are used with the trucks proper while the trailers, separate and complete vehicles, are of as light construction as the circumstances will permit.

Van and Trailer

The illustration shows the trailer, a slatlike structure, mounted on the four wagon wheels, which follows the usual horse-vehicle construction, steel tired and is protected with a canvas waterproof cover. There is a long shaft which is provided with a hook for attachment to a steel loop in the center of the rear cross member of the frame. The end of the hook is slotted or broached and a slip key serves as a lock. The brake is set on the rear wheels.

Officials of the company, when questioned about the trailer, said that they have proven very useful for the long suburban hauls. In a sense, the work of the tractor is doubled. If the goods to be hauled from one place to another make a van and one-half in load why the small trailer is attached, or, if the load makes two vans full the larger is employed.

HOW THE MOTOR TRUCK IS HELPING THE CITY OF DETROIT IN LAYING ASPHALT

The motor truck has found another field in which it has proved its usefulness.

The experiments being made by the City of Detroit in the laying of asphalt, with the aid of a five-ton G-M-C truck, equipped with mechanical dumping body, warrants the above statement, for its use not only expedites the unloading of this material, but enables the workmen to spread it while hot, thereby improving the surface of the pavement, for, if asphalt is laid while it is of the right temperature, it packs much smoother.

The G M C Motor Truck Used by the City of Detroit in Laying Asphalt. The truck is of five ton capacity type, with a specially designed tail-end dumping body. This body is hoisted mechanically and the asphalt dumped by means of a gate opening up and outward.

Work was being done three and two-tenths miles from the asphalt plant. The motor truck made each trip every fifty-five minutes, carrying five tons of asphalt which will spread over an area of 70 sq. yds. In all, eight trips were made each day, delivering a total of 84,000 lbs., or 42 tons The distance covered by the truck was over fifty miles a day. In comparison with horse-drawn teams—aside from the disadvantages—each team could only make the trip three times a day, delivering a total of 9 tons of asphalt. It will be seen from this that the truck is doing the work of five teams.

CADILLAQUA is the name applied to the big merry-making which will take place in Detroit, Mich., the last week of July. The home of the automobile will celebrate its 211th anniversary in a week filled with festivities, which will be a fitting birthday party for Detroit, rivalling Mardi Gras. The week's program will consist of water fetes, parades, boat races and pageants, including the most unique automobile parade ever held, with 12,000 machines in line, valued at $25,000,000.

Advertisers' Index

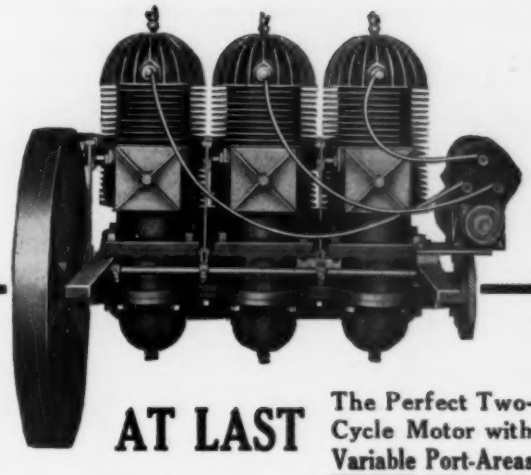
AUTOMATIC ALARM TO PREVENT EXCESSIVE SPEEDS

The General Industrial Manufacturing Company, Indianapolis, Ind., who recently started to manufacture commercial cars has announced that their 1500 lb. delivery cars will be equipped with the Torbenson internal gear axles, and also an automatic alarm which will blow a whistle making a shrill sound and will warn the driver of the truck that he is driving at a certain speed. It will not only be of advantage to users of the streets, but will also be a warning to the driver that he is going too fast.

GENERAL VEHICLE COMPANY has recently received an order from the Brown and Sharpe Manufacturing Company for an electric truck. This makes the third truck of this type that that company has installed.

INTERNATIONAL MOTOR COMPANY'S New York branch has been awarded the New York City contract for five 2-ton chassis, with combination hose and pumping engine bodies, for the suburban service of the New York Fire Department. These combination hose and chemical wagons will be of the Mack type, and will make 10 pieces of motor fire apparatus supplied by this company to New York City within the past eight months.

Don't waste valuable time trying to find out certain things about parts and accessories used on trucks, but write to us, and we will tell you where they are made, who makes them and whether they are on the market or not.



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(Fixed ports, as in regular two-cycle design, mean lack of flexibility and high fuel consumption.)

The result is a power plant combining two-cycle simplicity and low upkeep cost, with four-cycle flexibility of control and fuel economy.

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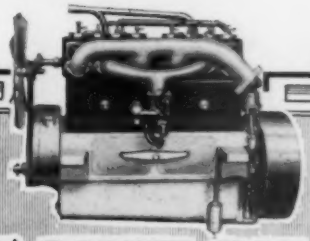

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EFFICIENCY is the Waukesha Motor's best eulogy. It is efficient because it is constructed to give the utmost in service.

The Waukesha crankshaft has a tensile strength of 70 tons. The bearings have three times the wearing quality of ordinary bearings. Both these metals are our own processes. The rest of the motor is on par with these two features. When we can prove all this why not ask us to?

Why not learn that you can put a motor in your trucks that will *exceed* your broadest guarantee of efficiency, wear and economy of fuel? Your request will bring proof that will leave no doubt of the Waukesha Long-Stroke Motor's supremacy.

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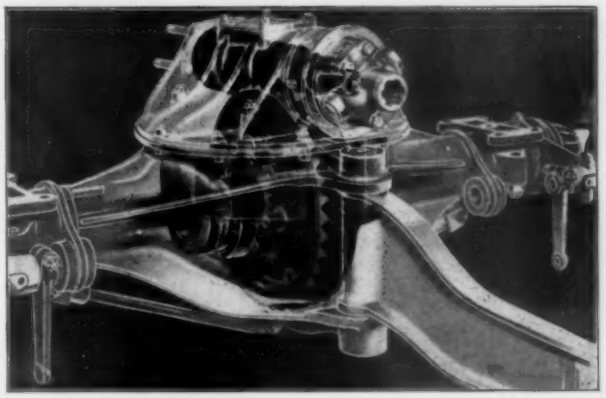
AN EXCEPTIONAL MOTOR



That the worm gear drive is the least wasteful and most durable pathway for power has been proved during ten years of successful use in England—is being proved every day in America by the Pierce-Arrow Truck.

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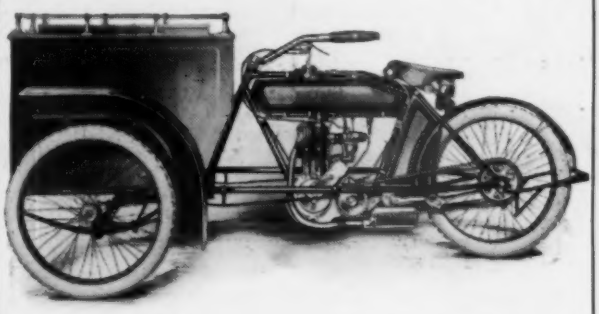
And will do the work of three horse-drawn vehicles.



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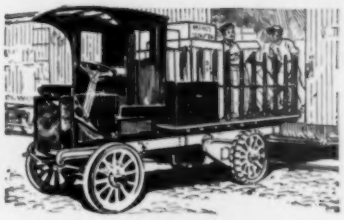

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depends upon the performance of the motor. For heavy traffic or light, high speed or low,

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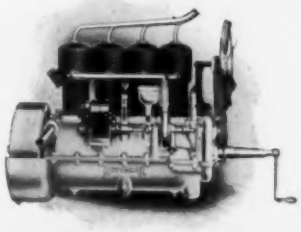

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Have been the standard of Europe for many years. These chains run with remarkable accuracy and precision, their construction and design make them positive and flexible.

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Aries
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80,000 Miles and Over on One Set of Tires

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The special features of construction—the interlocking spokes—the tight immovable center assemblage—insure the wheel under the most severe strain. Spokes cannot work loose, and it will always run true.

You want the BEST for it is the CHEAPEST in the end.

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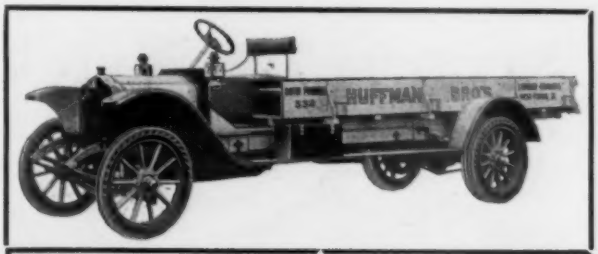

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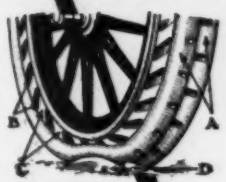
have double, notched treads (see A) which prevent skidding and distribute the weight to the sides. The undercut sides (see B) allow free action of the bridges (see C). The bridges, being elastic and slantwise, give and yield like air in pneumatic tires.



A—shows double, notched treads.
B—shows undercut sides.
C—shows slantwise bridges.
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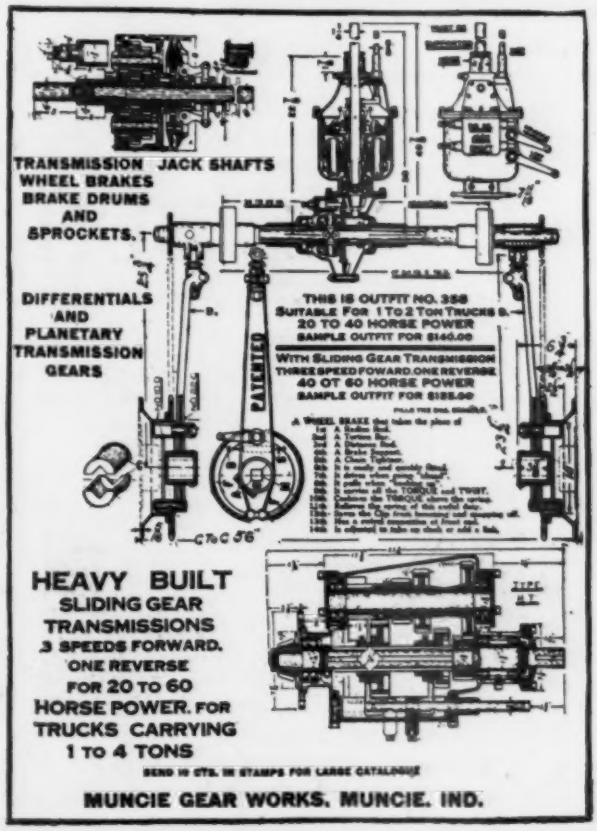

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A trial will convince you that our statements are true.

You cannot afford to use a wheel you know nothing about—the experience will prove disastrous as well as expensive.

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More Power and Speed with Less Gasoline
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Is Made for Getting More Power and Speed with Less Gasoline

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The M. & M. Economizer goes on the intake pipe and operated by foot pedal, uses no gasoline whatever going down grades. What the coaster brake is to a bicycle the M. & M. is to the automobile.

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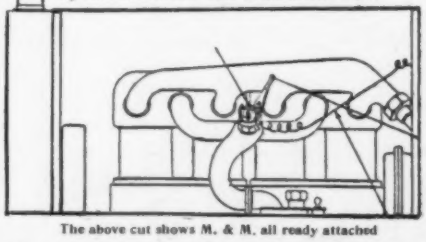
Used with highly satisfactory results by Commercial Car Manufacturers



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Is an advanced type of gasolene pump designed to meet present existing conditions.

Thirty Gallons Per Minute

This new Bowser pump is particularly designed to meet your requirements. It means greater speed, accuracy and efficiency in service. When you have to get out 20 trucks in 20 minutes you need it.

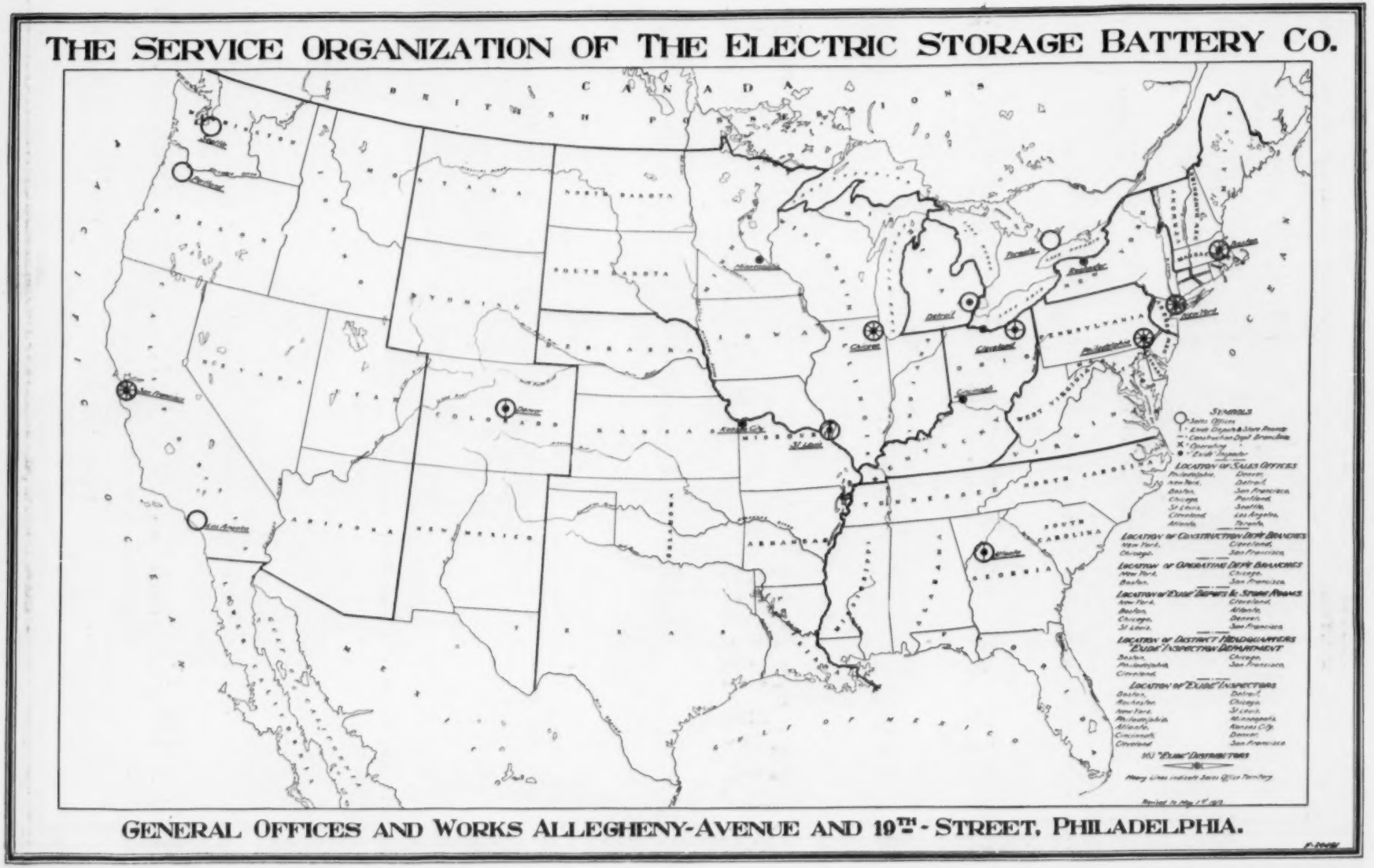
Investigate the Bowser System. Ask us for details. Send for catalog No. 11.

S. F. BOWSER & CO., Inc., Ft. Wayne, Indiana

New York Boston Philadelphia Minneapolis St. Louis Atlanta Dallas San Francisco Chicago Toronto

Manufacturers of self-measuring pumps, oil storage systems and tanks, oil filtration and circulating systems, self-registered measures, etc. Established 1885

The Service You Get with "Exide" Batteries

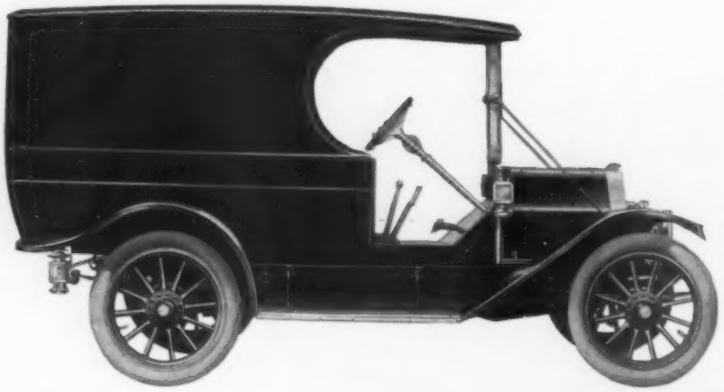


Overland

Two New Delivery Cars

Model 59

These delivery models carry bodies of ample dimensions. Each is handsomely finished and has a carrying capacity of 800 pounds. The "Special" is accessible by two large doors at rear, extending full height.



MODEL 59 DELIVERY "SPECIAL." PRICE, $1000

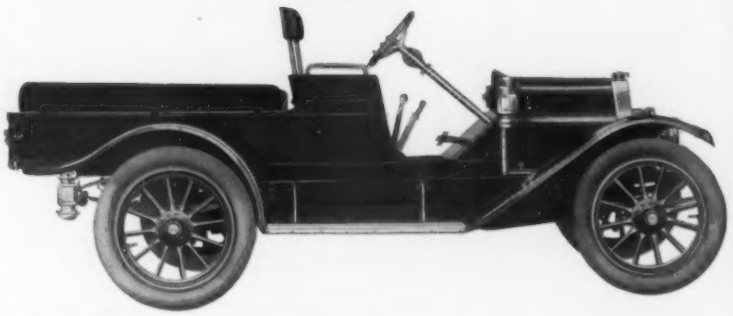
BODY SPECIFICATIONS

Length of floor - - - - 60"
Width of floor - - - - 43"
Height from floor to top - 53"
Tires - - - - - 33" x 4"
Color: Maroon with black trimmings.

MODEL 59 DELIVERY "EXPRESS." PRICE, $950

BODY SPECIFICATIONS

Length of floor - - - - 67"
Width of floor - - - - 42"
Height of side - - - - 10"
Width of side wings - - 6"
Tires - - - - - 33" x 4"
Color: Overland blue with gold trimmings.

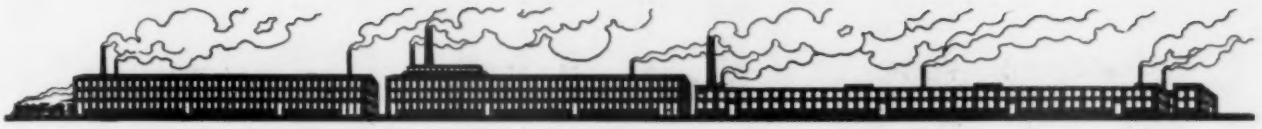


Specifications of Chassis

Wheel Base—106 inches.
Tread—56 inches.
Motor—4 x 4½.
Horse-Power—30
Transmission—Selective, three speeds and reverse.
Clutch—Cone.
Ignition—Dual, Splitdorf magneto and batteries.
Brakes—On rear wheels, 2 inches wide, 10-inch drums, internal expanding, external contracting.
Springs—1¾ inches wide, semi-elliptic front, three-quarter elliptic rear.
Steering Gear—Worm and worm gear adjustable, 16-in. wheel.
Front Axle—Drop forged I-section.
Rear Axle—Semi-floating.
Wheels—Artillery wood, 12 1½-inch spokes, 12 bolts each wheel.
Frame—Pressed steel.
Finish—Overland blue.
Equipment—Three oil lamps, two gas lamps and generator.
Tools—Complete set.

Write for a catalogue. Please ask for Book N-47

The Willys-Overland Co. **Toledo, Ohio**



WESTON-MOTT CO. FACTORIES AT FLINT, MICH.—LARGEST MAKERS OF AUTOMOBILE AXLES, HUBS AND RIMS IN THE WORLD

A Car Fitted with

WESTON MOTT CO

Axles
Hubs
Rims

Has a certificate of character that it could get in no other way

Each working part is accurately adjusted before we send it out

Let our expert engineering staff help you with your designs

Every part is tested and thoroughly inspected before it leaves our factory

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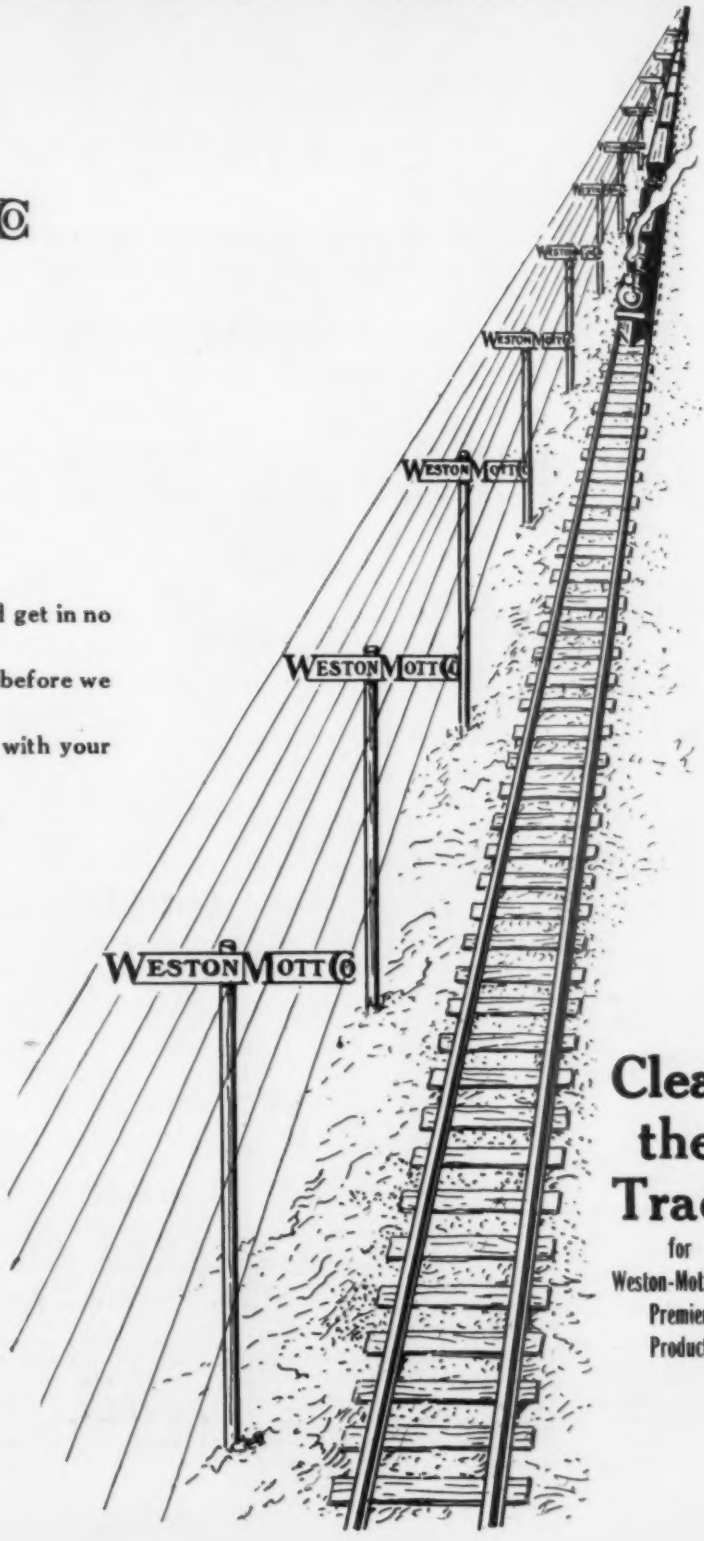
Flint, Mich.

R. S. V. P.



Clear the Track

for Weston-Mott Co. Premier Products

COMPLETE INSTALLATIONS

GASOLINE **GMC** ELECTRIC

TRUCKS

COMPLETE SERVICE

Model H, 3½ tons G M C Gasoline Truck, owned by Wm. Spink, Philadelphia. Price, chassis only, $3500.

Buying the *right* truck from the *right* manufacturer is as necessary as *right* capacity and *right* power. Each is of vital importance in installing motor transportation and must be given deep consideration if service and satisfaction *plus* economy is to be expected.

You should fully understand the broad scope of the General Motors Truck Company; you should know that it not only builds both gasoline and electric motor trucks, but in such standard capacities, from 1000 lbs. to 6 tons, that "there's a G M C truck to fit every business."

To install such a highly standardized line as the G M C has many advantages. Your problem may be comparatively small today, but very large within a year or so. The engineering and mechanical resources of the Company are so great as to meet the most exacting demands at any time.

Again, your equipment may call for both gasoline and electric trucks, because each serves best in its own field. G M C trucks are built for both powers. Thus, your entire installation is under a *single centre* of responsibility. Weigh this well as against an *unstandardized* fleet of trucks!

Behind every G M C truck stands G M C "service"—as strong, as complete, as helpful *after*-sale as *before*-sale.

The vast resources of General Motors Truck Company must appeal to business with very great problems.

It is important you should read our gasoline or electric catalogs—*or both!* Sent free on request.

Correspondence from prospective purchasers and dealers is invited.

GENERAL MOTORS TRUCK COMPANY

PONTIAC, MICHIGAN

Branches: New York, Chicago, Boston, Philadelphia, Kansas City, Detroit

Four of a Fleet of 10 Detroit Electric Commercial Vehicles owned by the Detroit News, Detroit, Mich.

THE many re-orders for Detroit Electric Commercial Vehicles are the most convincing proof that they are real money-savers. One large newspaper using a fleet of Detroit Electric Commercial Vehicles, states that it cannot afford any other form of transportation because of the Detroit Electric's reliability and economy of operation.

City deliveries mean many stops. It is readily apparent that a commercial vehicle, electrically driven is the most practical for city and suburban uses, just as naturally as electric street railways, electric elevated railways and electric locomotives for steam railroad terminals are taking the place of all other forms of locomotion.

Did you ever stop to think that wherever electricity has solved any problem, it has done so better than any other form of power?

Detroit Electric Commercial vehicles "get-away" instantly in congested traffic. All speeds are controlled with one lever. Any ordinary driver can learn to operate a Detroit Electric. No expert care is necessary. There is no complex mechanism to be put out of order by abuse or carelessness. When the car stops, the power stops—and the expense for power.

THE Detroit ELECTRIC
Commercial Vehicles

are noiseless, odorless, trim in appearance and are particularly appreciated by customers in all residential districts. They are admitted at all wharves and freight terminals. Fire hazard is reduced to a minimum. All body space is available except the driver's seat. They occupy only their own space in a garage.

Detroit Electric Commercial vehicles are built exclusively for the Edison nickel and steel battery. This battery of itself is about 300 pounds lighter in a Detroit Electric commercial vehicle than a lead battery equipment. This admits of an all metal chassis and lighter construction throughout the car. Lighter weight means more mileage, less wear on bearings and tires and less cost for power to move the car and its load.

The saving which would be effected by the use of the cheapest and most readily adapted form of power in existence is made possible for you through the use of Detroit Electric commercial vehicles.

48-page illustrated catalog with full information will be sent upon request. Specific information regarding your individual requirements will be gladly furnished.

ANDERSON ELECTRIC CAR COMPANY

456 Clay Ave., Detroit, U. S. A.

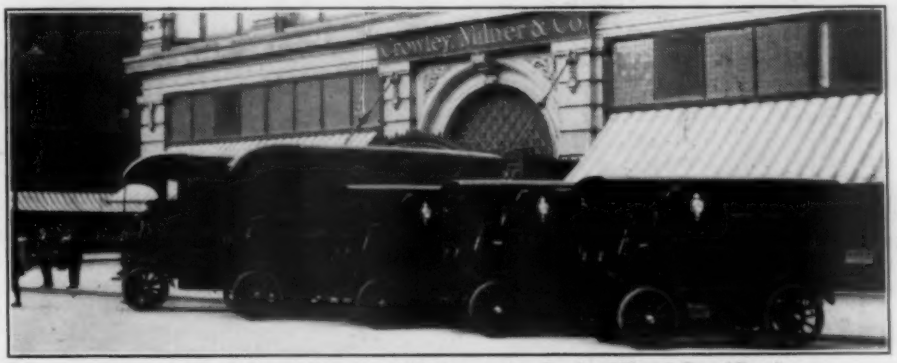
Branches:

Buffalo
Brooklyn
Cleveland

New York: Broadway at 80th Street
Chicago: 2416 Michigan Avenue
(Also Branch at Evanston, Ill.)

Kansas City
Minneapolis
St. Louis

Selling representatives in all leading cities



Fleet of 5 Detroit Electric Commercial Vehicles owned by Crowley, Milner & Co., of Detroit

Panel Body, $1800
Capacity, 1500 Pounds

Lippard-Stewart Delivery Cars

Panel Body $1800
Express Body with top $1775
Open Box Body $1775
Stake Body $1775
Police Patrol $2325
Ambulance $2325
Hotel 'Bus $2325

Make Money Selling Lippard-Stewart Motor Delivery Cars

SCORES of live dealers throughout the country have realized the big money-making possibilities of handling Lippard-Stewart delivery cars.

They have discovered that this car—the first high-grade commercial car at a low price—is just what merchants have been looking for.

They have found that the many up-to-date, exclusive features of the Lippard-Stewart make it a quick and easy seller. Everywhere this car appears it immediately attracts favorable attention.

Special Lippard-Stewart Features, Latest and Best

1. Four-Cylinder Monobloc Motor.
2. Selective Transmission.
3. Multiple Disc Clutch.
4. Shaft Drive.
5. Special Timken Rear Axle.
6. Left-Hand Steering.
7. Bosch Magneto, Single Ignition.
8. Thermo-Syphon Cooling.
9. Special Spring Suspension.
10. Handsome Lines—Beautiful Finish.

Big Field for Business

The commercial car field affords the biggest opportunities nowadays. In this field the light delivery car offers the widest market; and among light commercial cars none is such an attractive selling proposition as the Lippard-Stewart.

Note the special Lippard-Stewart features listed above. Consider the following reasons why this car proves a profitable line to handle:

1. Lippard-Stewart cars know no "seasons." They are always needed, always ready for use and sell just as readily in winter as in summer.
2. They are never "a last year's design." Trades are not asked for, as is often the case in selling pleasure cars.
3. Fancy showrooms unnecessary to sell Lippard-Stewart delivery cars. Service and utility looked for as a good business investment.
4. It is easy to show merchants how Lippard-Stewart delivery cars will pay for themselves out of the savings they effect over horse delivery.
5. No trouble to locate prospects for Lippard-Stewart cars. Every merchant with a delivery problem is a prospective buyer.
6. You may sell several cars at once by the same effort that would sell one pleasure car. Satisfactory service of one economical vehicle makes repeat orders easy.

An Opportunity for You

We still have some choice territory open for dealers. Perhaps your city is one where we are not yet represented. If so, do not overlook this opportunity. Send in the attached coupon for our dealers' proposition. Let us help you make this the most profitable year you have had.

LIPPARD-STEWART MOTOR CAR CO.
Buffalo, N. Y.
Please send catalogue and dealers' proposition.
Name .....
Street .....
City ..... State .....

Lippard-Stewart Motor Car Company, Buffalo, N. Y.

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